MYCOTAXON

Volume 112, pp. 103–141 *April–June 2010*

Type studies and nomenclatural revisions in *Parasola (Psathyrellaceae)* and related taxa

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Abstract — Basidiomycetes belonging in the genus *Parasola* and some satellite taxa have been revised on the basis of type studies and original diagnoses. As a result of an extensive taxonomic survey, 34 names affiliated with *Parasola* (formerly *Coprinus* subsections *Glabri* and *Auricomi*) have been identified. Type materials of 15 taxa have been found in various herbaria and examined. These taxa are described and their basidiospores, basidia, cheilocystidia, pleurocystidia, and pileipelli illustrated. The results support *P. leiocephala* as a synonym of *P. lactea*. An epitype for *P. plicatilis* and a neotype for *P. misera* are designated and illustrated in detail. *Parasola auricoma* is lectotypified. *Pseudocoprinus besseyi* and *C. elongatipes* are synonymized with *P. auricoma*. The type of *P. galericuliformis* represents an immature *P. lactea*. *Coprinus plicatilis* var. *filopes* is a later synonym of *P. lactea*. *C. longipes* and *C. rimosus* are synonymized with *P. schroeteri*, while *Pseudocoprinus brunneolus* belongs to *P. lactea*. Where possible, our conclusions were confirmed by molecular phylogenetic analyses.

Key words —synonymization, deliquescence

Introduction

The genus *Parasola* Redhead et al. (formerly *Coprinus* subsection *Glabri* and *Auricomi*) comprises coprinoid taxa that lack veils and caulocystidia and have parasol-like, non-deliquescent pilei (Doveri 2004, Orton & Watling 1979, Redhead et al. 2001, Uljé & Bas 1985). Nagy et al. (2009) have recently referred to the process of fruitbody maturation observed in *Parasola,* which differs from both "true" deliquescence and non-deliquescence, as "collapsing", in order to avoid confusion with non-deliquescent coprinoid and *Psathyrella* taxa. Although many widely distributed, well-known taxa belong here, such as *P. plicatilis* (Curtis) Redhead et al. or *P. leiocephala* (P.D. Orton) Redhead et al., taxonomic delimitation is still problematic and much confusion surrounds most species.

Redhead et al. (2001) recognized 18 taxa in the genus *Parasola*, resurrecting a number of taxa forgotten in the recent literature, such as *Coprinus mirabilis*,

C. pachyterus, *C. setulosus, Pseudocoprinus lacteus, Ps. brunneolus,* etc. Many of these, however, are known only from the type collections. Furthermore, in the cases of *C. mirabilis*, *Ps. lacteus, Ps. besseyi,* and *Ps. brunneolus*, no modern description or type study was available, so it has been impossible to come to any conclusion concerning status. In the present study, we have revised all available type materials and validly published names of "collapsing" taxa that belong to, or have been affiliated with, the genus *Parasola* or *Coprinus* subsection *Glabri* and *Auricomi*. Taxa with missing or unavailable types have also been revised based on their original descriptions.

Materials and methods

Attempts were made to locate type materials of all validly published names connected with *Parasola* or *Coprinus* subsection *Glabri* and *Auricomi*. Types of 15 taxa were obtained on loan. Where we did not succeed in locating or obtaining the type specimens on loan, we base our comments exclusively on the original description. Despite repeated attempts, we were unable to obtain type material of *P. subprona* (Cleland) J.A. Simpson & Grgur. and *P. virgulacolens* (Cleland) J.A. Simpson & Grgur. on loan. 'Non-collapsing' *Parasola* taxa, i.e. *P. conopila* and its close allies (Larsson & Örstadius 2008, Padamsee et al. 2008, Vasutová et al. 2008) are not considered here.

As there is no type collection for the widely known taxon, *P. misera*, we selected a neotype to stabilize its nomenclatural status by adhering to the following criteria: (i) the neotype should accord with the original description as closely as possible; (ii) if the original description is not sufficiently diagnostic, the neotype should conform to the currently most widely-accepted usage of the name, unless this contradicts the original description; (iii) the neotype should be typical of the taxon it intends to represent; and (iv) a rich, complete collection should be selected that allows examination of all taxonomically important features. We did not attempt to select collections that originated from the type locality of the holotype. This may be important if it is presumed (e.g., from molecular studies) that the taxon is composed of many cryptic species, resulting from allopatric speciation. Neither morphological nor molecular studies (Nagy, unpublished results) suggest cryptic speciation in *P. misera*. Types have been deposited in BP, and parts of the type materials can be found in SzMC (Szeged Microbiological Collection).

All anatomical observations were made from dried material, except in the cases of the neotype of *P. misera* and the epitype of *P. plicatilis*, which were macroscopically annotated from fresh material. Before examination, herbarium materials were revived in 10% KOH, then mounted with Congo Red in NH_4OH. Unfortunately, many types were in poor condition because of their age and/or fruiting bodies poorly preserved by the collector. At times, most of the important features had collapsed, and only basidiospores could be observed. To mitigate the effects of partially collapsed fruitbodies we applied a longer treatment in 10% NH_4OH solution: up to 1.5–2 hours. This gave improved dissection in many cases.

Drawings of microscopic characters are based on microphotographs. Measurements were made at ×1000 with a calibrated optical micrometer. Basidiospore measurements are based on at least 20 samples from each collection. The numbers in square brackets

after the word „Basidiospores" refer to the number of spores measured, the number of fruiting bodies examined, and the collections they originate from, respectively. Spore measurements are given as follows: length range × breadth range × width range. Q values were calculated as follows: Q_1 = length divided by breadth; Q_2 = length divided by width. Measurements of basidia included sterigmata. Pleurocystidia and cheilocystidia were observed and measured by cutting the gill edge from the rest of the gill to avoid blending of the two cystidial types. The interpretation of microscopic details follow standard conventions (Vellinga 1988). Abbreviations of names of herbaria follow Holmgren et al. (1990).

Results

Our extensive literature search identified 34 names that (potentially) belong to the genus *Parasola*. Of the 34 names associated with *Parasola* or *Coprinus* subsection *Glabri* and *Auricomi,* we examined type collections representing 15 taxa: *C. pallidus*, *Agaricus leptosceles*, *C. galericuliformis*, *C. hercules*, *C. kuehneri, C. leiocephalus*, *C. lilatinctus*, *C. megaspermus*, *C. nudiceps*, *C. pachyterus*, *C. plicatilis* var. *filopes*, *C. schroeteri*, *C. setulosus*, *Pseudocoprinus besseyi,* and *Ps. lacteus.* Among the remaining 19 taxa, types of *C. plicatilis, C. elongatipes* and *C. miser* are missing, while for the other 16 we could not obtain or locate the type. Missing types were sought in several herbaria. We located type specimens of *C. virgulacolens* and *Psathyrella subprona* (in AD), but they were not available on loan. Comments on taxa with unavailable types are based on the original descriptions or type studies published by other authors (Grgurinovic 1997, Pegler 1986).

We have lectotypified *P. auricoma* to stabilize its nomenclatural status, epitypified *P. plicatilis,* and designated a neotype for *P. misera*. *Parasola leiocephala*, *P. galericuliformis*, and *Pseudocoprinus brunneolus* are synonymized with *Ps. lacteus*. Types of *Ps. besseyi* and *C. elongatipes* were found to be conspecific with *P. auricoma* and are proposed as synonyms of that species. *C. longipes* and *C. rimosus* turned out to be younger synonyms of *P. schroeteri*. The results of the type studies, herbarium details, and nomenclatural revisions are summarized in Table 1.

Type studies

Agaricus leptosceles Berk. & Broome, Journal of the Linnean Society, Botany 11: 558 (1871). Fig. 4–5.

Isotype: Sri Lanka: Peradeniya, September 1868, G.H.K. Thwaites 770 (Berk. 1348) (K).

Original diagnosis: *Pileo hemispherico, acute umbonato subtiliter tomentoso, usque ad umbonem striato, stipite gracili (No. 770).* On the ground. Peradeniya. Sept. 1868.

Pileus 1-inch across, striated up to the acute and elongated truncate umbo; stem 2.5–3 inches high, 1/2 line thick; gills ventricose, shortly adnate, spores egg-shaped, – 0003 long [0.0003 inches]. Allied to *A. hydrophorus.*

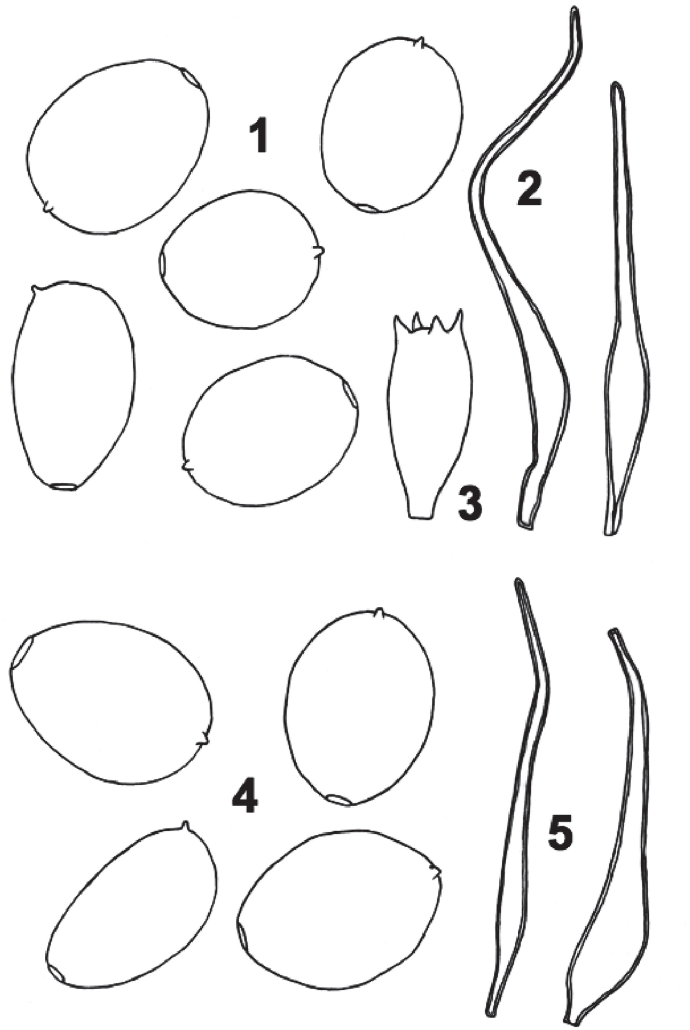

Fig. 1–5. Type material of *Coprinus pallidus* and *Agaricus leptosceles*. Spores (1), basidium (2), and sclerocystidia (3) are depicted for *C. pallidus*. Figs. 4 and 5 represent spores and sclerocystidia of *A. leptosceles*, respectively

Observations on the type—In the type envelope, there are 3 half fruiting bodies glued on a paper card, in a rather good state. Their pale-greyish pilei are more similar to dried *P. conopila* specimens, but the gills are more reminiscent of deliquescent *Parasola* taxa.

Table 1. Synopsis of the proposed nomenclatural changes and the status of taxa in the genus *Parasola*.

Taxon name	Type	Name status/ Current name
Agaricus leptosceles	K	*P. setulosa*
Agaricus plicatilis	Lectotype & epitype (BP) selected here	*P. plicatilis*
Agaricus subtilis	?	Rejected name
Coprinus auricomus	Lectotype selected here	*P. auricoma*
Coprinus elongatipes	Not existent	*P. auricoma*
Coprinus galericuliformis	E	*P. lactea*
Coprinus hansenii	Not existent	*P. auricoma*
Coprinus hemerobius	Not existent	Rejected name
Coprinus hercules	L	*P. hercules*
Coprinus kuehneri	L	*P. kuehneri*
Coprinus leiocephalus	E	*P. lactea*
Coprinus lilatinctus	L	*P. lilatincta*
Coprinus longipes	?	*P. schroeteri*
Coprinus megaspermus	E	*P. megasperma*
Coprinus mirabilis	?	Rejected name
Coprinus miser	Neotype (BP) selected here	*P. misera*
Coprinus miser f. *marasmioides*	?PC	*P. misera*
Coprinus nudiceps	E	*P. schroeteri*
Coprinus pachyterus	K	?= *Coprinopsis vermiculifera*
Coprinus pallidus	K	*P. setulosa*
Coprinus plicatilis var. *filopes*	PRM	*P. lactea*
Coprinus plicatilis var. *microsporus*	?PC	*P. kuehneri*
Coprinus plicatilis var. *tenellus*	?GH or W	*Coprinopsis* sp.
Coprinus proximellus	Not in NY	Rejected name
Coprinus pseudonycthemerus	Probably not existent	? = *P. schroeteri*
Coprinus rimosus	Not in UC, MICH, WELT	*P. schroeteri.*
Coprinus schroeteri	H	*P. schroeteri*
Coprinus setulosus	K	*P. setulosa*
Coprinus sulphureus	?	? = *P. auricoma*
Coprinus virgulacolens	AD	Rejected name
Psathyrella subprona	AD	? = *P. megasperma*
Pseudocoprinus besseyi	MICH	*P. auricoma*
Pseudocoprinus brunneolus	?CFMR	*P. lactea*
Pseudocoprinus lacteus	MICH	*P. lactea*

Basidiospores [20,1,1] 9.3–12.6 × 7.6–9.8 × 6.3–7 µm, on average 10.8 × 8.6 × 6.7 µm, Q_1 = 1.17–1.43, Q_2 = 1.47–1.54 lentiform, in the frontal view ovoid–subglobose, some slightly rounded triangular, with an obtuse apex, which may seem concave in some cases due to the large germ-pore, and more or less obtuse base, some with a more acute base (like *Panaeolus acuminatus* (Schaeff.) Quél.), in the lateral view ellipsoid, germ-pore central, 1.8–2 µm wide; basidia, cheilocystidia, and pleurocystidia not observable; pileipellis collapsed, with scarce, thick-walled lageniform hairs, ca. 120–130 × 5–10 µm.

Several papillate subglobose spores found on the cap cuticle do not belong to this fungus.

Remarks—On the basis of the presence of thick-walled hairs on the pileus and the lentiform spores with a central germ-pore, this taxon is identical with *P. setulosa*, another taxon described from the same place at the same time, a fact already noted by Pegler (1986). As in *C. pallidus*, the only difference between *A. leptosceles* and *P. setulosa* is the much larger sclerocystidia, found in the type of the latter species.

Coprinus galericuliformis Losa ex Watling, Notes from the Royal Botanic Garden, Edinburgh 28: 42 (1967). Figs. 6–9.

Holotype: United Kingdom, Scotland: Edinburgh, Royal Botanic Garden, 14 May 1966, Watling 26310 (E).

Original diagnosis: *Pileus primo glandiformis vel ellipticus altus, 6–15 mm vix expansus clare fulvo-ochraceus vel ferrugineo-mellinus vulgo ad discum obscurius coloratus. Stipes 10–35 × 2–3 mm, subaequalis ad basim leviter incrassatus, albus. Caro concolorata siccitate intus albida. Lamellae fere liberae ex albo albida vel cacainae dein nigro-umbrinae; basidia 4-sporigera; basidiosporae 10.5–12.5 × 10–11 × 5–7 µm lentiforme poro germinativo. Cheilocystidia ellipsoideo-vesiculosa. Pleurocystidia et velum absentia.*

Observations on the type—The holotype, which is in a good state, contains numerous fruiting bodies in different stages of maturity.

Basidiospores [20,1,1] 10–12 × 9.8–10.9 × 5.3–7.2 µm, on average 11.68 × 10.31 × 5.96 µm, Q_1 = 1.02–1.25, Q_2 = 1.66–2.10, strongly lentiform, in the frontal view broadly ovoid to subglobose, more rarely angular or rounded triangular, in the lateral view ellipsoid or amygdaliform, with an up to 1.8 µm wide, eccentric germ-pore, mainly immature, medium dark reddish brown, smooth, with a moderately thick wall; basidia four-spored, clavate, 22–27 × 8.5–11 µm; cheilocystidia abundant, lageniform, utriform or subcylindrical, 19–53 × 12–30 µm; pleurocystidia utriform, oblong or cylindrical, 40–82.5 × 15–27 µm; pileipellis hymeniform; veil, pileocystidia, and caulocystidia not found.

Remarks—On the basis of the shape and the size of the basidiospores, this collection belongs to *P. lactea* (*P. leiocephala)*. The holotype fruitbodies are

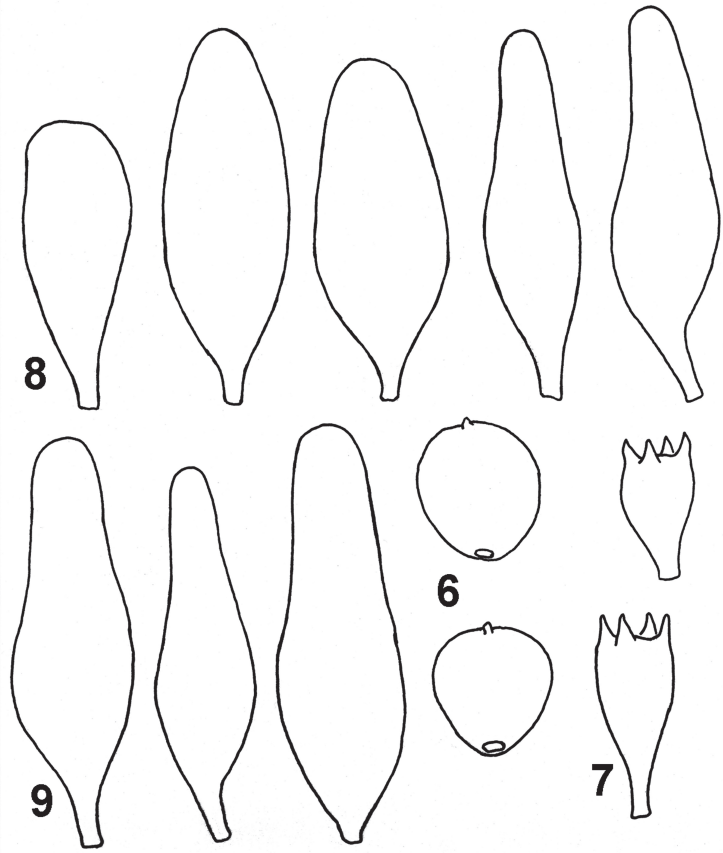

Fig. 6–9. Spores (6), basidia (7), cheilo- (8), and pleurocystidia (9) from the type of *C. galericuliformis*.

imperfectly matured, which causes the basidiospores to be more globose than typical in *P. lactea*. In our experience, the basidiospores reach their final rounded triangular or angled shape in the last stage of development, and accordingly no taxonomic value can be assigned to subglobose basidiospores in this case. Specimens with subglobose spores have recently been included in ITS- and LSU-sequence based phylogenetic analyses. With strong support from Bayesian, Maximum Likelihood, and Maximum Parsimony analyses, they were nested in the clade formed by *P. lactea* specimens (Nagy et al. 2009). That study strongly suggests that subtle spore shape differences should be regarded cautiously and that spore size should be given higher priority in defining the taxa of *Parasola*.

According to the original description (Watling 1967), the pleurocystidia are lacking, a statement that we cannot confirm here. Numerous utriform–oblong pleurocystidia were found on the sides of the gills. A lack of pleurocystidia would be surprising, as all but one collapsing species (*P. misera*) of *Parasola* possess pleurocystidia.

Roux & Garcia (Roux 2006) recently treated *P. galericuliformis* (and *P. leiocephala*) as a variety of *P. plicatilis*. However, our molecular and morphological results suggest that *P. galericuliformis* is synonymous with *P. lactea* (= *P. leiocephala*) a species distinct from *P. plicatilis* (Nagy et al. 2009).

Coprinus hercules Uljé & Bas, Persoonia 12: 483 (1985). Fig. 10.

Holotype: The Netherlands: Leiden, 10 August 1984, C.B. Uljé (L).

Original diagnosis: *Pileus primo campanulatus vel hemisphaericus, dein convexus vel applanatus, 8–14(–17) mm latus, sulcatus usque ad centrum, brunneus vel pallide brunneus, postea cinerascens, nudus. Lamellae liberae, subdistantes (L = 16–24; l = 0–1(–3), ex albo cinerascentes vel nigricantes. Stipes 48–71 × 0.6–1.2 mm, sursum subattenuatus, albidus, subvitreus, glaber, fragilis, basi subbulbosus. Sporae 12.4–17.2 × 11.3–15.2 × 8.2–10.8 µm, valde lentiformes, subtriangulatae vel subquinque-angulatae, poro germinativo excentrico instructae, obscure rubro-brunneae (fere nigrae), in cumulo purpureo-nigrae; basidia 4-sporigera. Cheilocystidia vesiculosa vel late utriformia, usque ad 50(–70) µm longa. 10–23(–30) µm lata. Pleurocystidia subutriformia vel subcylindrica, usque ad 105 µm longa, 22–30 µm lata. Pileipellis hymeniformis. Fibulae praesentes.*

Observations on the type—The holotype contains several well-preserved, but old, fruiting bodies. Unfortunately, all microscopic cells have collapsed except the basidiospores.

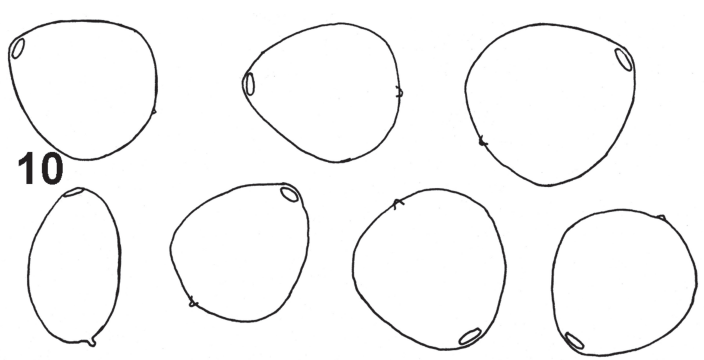

Fig. 10. Spores from the type of *C. hercules*.

Basidiospores [20,1,1] 13.8–17.5 × 14.8–16.9 × 10–11 µm, on average 15.83 × 15.42 × 10.63 µm, Q_1 = 0.9–1.15, Q_2 = 1.4–1.5; strongly lentiform, in the frontal view rounded triangular or quadrangular, more rarely subglobose or ovoid, in

the lateral view ellipsoid to amygdaliform, with a strongly eccentric, 2.6–2.7 µm wide germ-pore, color very dark reddish-brown, almost blackish, opaque, smooth, with a moderately thick wall; BASIDIA, PLEURO-, and CHEILOCYSTIDIA collapsed; PILEIPELLIS hymeniform; VEIL, PILEOCYSTIDIA, and CAULOCYSTIDIA not found.

REMARKS—The diminutive fruitbody size and the low number of lamellae could also be observed on the type. According to the general view (Uljé & Bas 1985, 1988, Vila & Rocabruna 1996), these are diagnostic features that distinguish *P. hercules* from *P. schroeteri*. In our experience, *P. schroeteri* is macromorphologically a very variable species, and poorly developed small fruitbodies can be encountered. Furthermore, habitat preferences cannot be considered diagnostic, as both *P. schroeteri* and *P. hercules* also occur on both dung and soil. Therefore, we assign diagnostic value only to the size of the spores. The distinction of *P. hercules* from *P. schroeteri*, however, is strongly supported by molecular results (Nagy et al. 2009).

Coprinus kuehneri Uljé & Bas, Persoonia 13: 438 (1988). FIGS. 11–15.

HOLOTYPE: The Netherlands: prov. Zuid-Holland, Leiden, park Leiden-Noord. 31 May 1987., C.B. Uljé (L).

ORIGINAL DIAGNOSIS: *Pileus ad 35 mm latus, sulcatus, obscure rubrobrunneus, interdum autantiobrunneus vel flavobrunneus, postea cinerascens, glaber. Lamellae stipite remotae, primo albidae, dein griseobrunneae vel atrogriseae. Stipes ad 100 × 3 mm, sordide albidus vel sordide albobrunneus. Sporae 6.5–10.5 × 5.5–8 × 5–6 µ, Q = 1.05–1.6, Q = 1.16–1.45, cordiformes, ad rhombeae vel mitriformes inclinatae, 3–4-, raro 5 angulatae, poro germilani excentrico praeditae. Cheilocystidia 30–80 × 12–28 µ, collo 11–23 µ lata, cylindrica vel utriformes, interdum sublageniformes vel elongato-ellipsoidea, raro fere solum globosa. Pleurocystidia 40–100 × 22–40 µ, collo 21–30 µ lata, plus minusve cheilocystidiis similia. Fibulae adsunt.*

OBSERVATIONS ON THE TYPE—The holotype is a good collection, containing many fruiting bodies, both young and old. All microscopic details could be observed on the material.

BASIDIOSPORES [20,1,1] 8–10.4 × 7.2–8.4 × 5.4–6.3 µm, on average 9.36 × 7.85 × 5.9, Q_1 = 1.12–1.28 Q_2 = 1.45–1.60, strongly lentiform, in the frontal view (narrowly) ovoid to rounded triangular, some with rhomboidal outline, in the lateral view amygdaliform, with an eccentric, ca 1.5 µm wide germ-pore, dark reddish-brown, almost opaque in NH_4OH, smooth, with a moderately thick wall; BASIDIA four-spored, dimorphic, 27–40 × 8–10 µm; CHEILOCYSTIDIA abundant, very variable in shape and size, mainly cylindrical-utriform with some clavate or fusoid ones, 39–75 × 12–31.2 µm; PLEUROCYSTIDIA numerous, predominantly cylindrical, a few broadly fusoid and ellipsoid, some with an enlarged apex, 55–113 × 21–33 µm; PILEIPELLIS a hymeniderm; VEIL, PILEOCYSTIDIA, and CAULOCYSTIDIA not found.

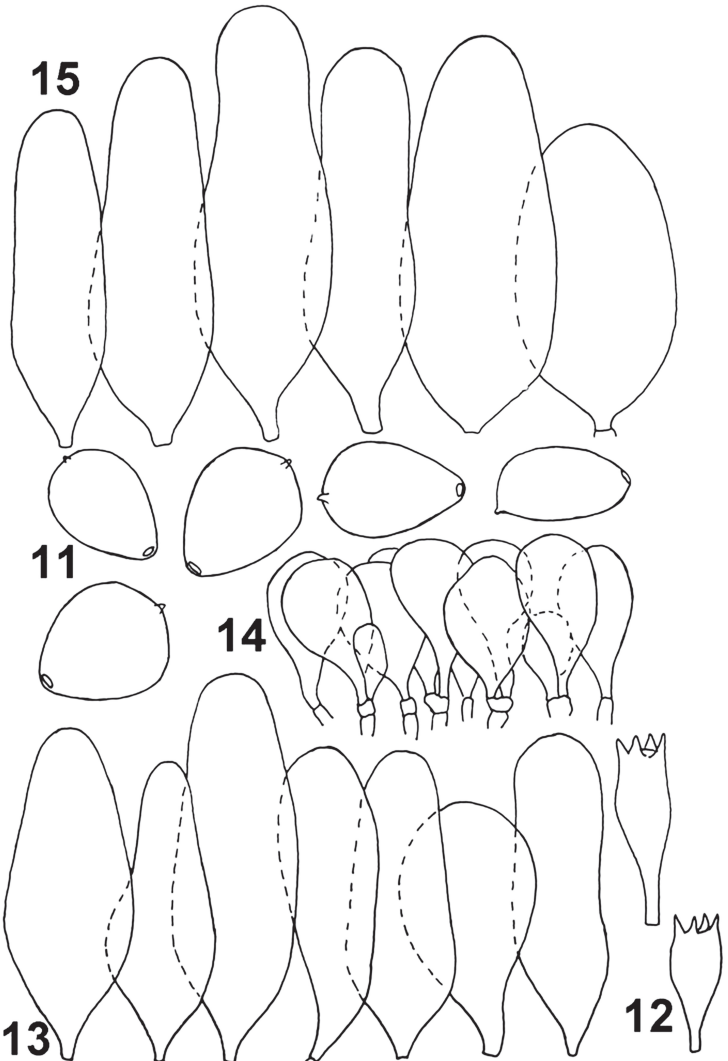

Fig. 11–15. Type material of *C. kuehneri*.
Spores (11), basidia (12), cheilo- (13), and pleurocystidia (15),
as well as pileipellis structure (14) could be observed.

Remarks—The spore size seems to be slightly too large as compared with other materials of this species (Nagy, unpubl.). Our observations in part contradict the original description (Uljé & Bas 1988) with regard to the size range of the

spores. We think that the explanation of this difference in spore sizes is because Uljé & Bas (1988) measured several immature spores as well.

Coprinus leiocephalus P.D. Orton, Notes from the Royal Botanic Garden, Edinburgh 29: 88 (1969). Fig. 16.

Holotype: Scotland: Wheatfen, Surlingham, Norfolk, 18 Sept. 1965. Orton 2566 (E).

Original diagnosis: *Pileus juventute 5–15 mm altus, 4–13 mm latus, dein 13–32 mm, ovoideus vel ellipsoideus dein conico-convexus, postremo expanso-convexus interdum ad discum depressus, castaneus, fulvo-brunneus vel ochraceo-mellinus ad discum obscuriore vel fulvo tinctus, siccitate pallide ochraceus vel sordide cremeus ad discum ochraceo-luteolobrunneus, rufo-brunneus vel fuscus, senectute circa marginem griseascens et radiliter sulcato-striatus, ad discum persistente laevis. Lamellae liberae, remotae, anguste lanceolatae, ex albido griseae vel colore pilei tinctae, postremo nigrescentes, vix confertae, L c. 32–40, l 0–1, ad aciem primo albo-flocculosae. Stipes (30)62–74(90)/1–2 mm, aequalis vel sursum leviter attenuatus, ex albo vel albido deorsum ochraceo-lutescens vel rufo-brunnescens; glaber, opacus, cavus, fragilis, ad basim albo tomentosus vel strigoso-tomentosus. Caro tenuissima, ad discum colore pilei concolorata. Odor nullus.*

Sporae lentiformes, ellipsoideae vel ovoideae leviter angulatae, poro germinativo excentrico aliquantum amplo, 8.5–11/5.5–6.5/7–8.5 µm (fig. 1, g), sub micr. obscure rufo-brunneo, in cumulo fere nigrae. Cystidia aciei lamellarum vesiculoso-clavata 30–42/16–32 µm, vel lageniformia ad apicem obtusa, 50–84(–92)/12–32 µm ad apicem 10–18(–24) µm lata. Cystidia faciei lamellarum vesiculose-clavate, pyriformia vel utriforme-lagiformia ad apicum obtuse lata c. 50–90/16–42 µm. Cellulae cuticulae pilei globosae vel ellipsoideae, setulae nullae.

Ad terram, solitarius vel catervatim, vulgo in locis humidis: Shobdon Herefordshire, 24 Oct. 1959; Wheatfen, Surlingham, Norfolk, 18 Sept. 1965, P.D. Orton. (typus in Herb. Kew.); ad solum vel ad lignam purridissimam solitarius vel subcaespitosus, Freshfield, Lancs., 16 Sept. 1959. A sporis et probibiliter habitatione distinguitur.

Observations on the type—The holotype contains mature, well-preserved fruiting bodies; unfortunately, however, only spores and incomplete, collapsed basidia could be observed.

Basidiospores [30,1,1] 9.5–12 × 8.4–9.5 × 6.2–7 µm, on average 10.73 × 8.81 × 6.73 µm, Q_1 = 1.06–1.32, Q_2 = 1.57–1.79 strongly lentiform, in the frontal view mainly ovoid, rarely rounded triangular, subhexagonal or subglobose, mostly with a rounded apex, rarely subpapillate, in the lateral view ellipsoid, with a moderately thickened wall, germ-pore eccentric, ca. 1.8 µm in diameter, color very dark reddish-brown, subopaque, smooth, with moderately thick wall; basidia four-spored, clavate, bimorphic, mainly collapsed; pleurocystidia and cheilocystidia collapsed; veil, pileocystidia, and caulocystidia not found.

Remarks—The basidiospores of the holotype mainly have an obtuse apex, in contrast to numerous other *P. leiocephala* collections cited as having basidiospores with an acute, often papillate end (Breitenbach & Kränzlin 1995, Lanconelli 2003, Orton 1972, Orton &Watling 1979, Uljé & Bas 1988, Uljé &

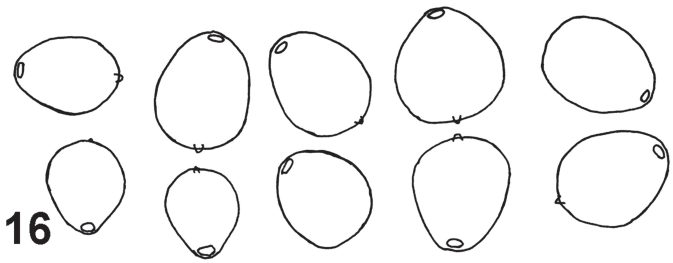

Fig. 16. Spores from the type of *C. leiocephalus*.

Bender 1997). Despite this discrepancy, the examined collection falls within the range of variability cited for this species. It is well known that *P. leiocephala* is an extremely variable species both macroscopically and microscopically (Uljé & Bas 1988, Uljé & Bender 1997, Nagy et al. 2009). Its spore shape ranges from markedly rounded triangular with distinct angles to subglobose with hardly visible angles. Further, spore shapes commonly vary considerably within a single fruiting body, showing different proportions of rounded and triangular spores (Nagy, unpubl.).

This species was recently reduced to varietal status under *P. plicatilis* (Roux 2006). There is, however, strong (phylogenetic) evidence in favour of treating *P. leiocephala* as a species separate from *P. plicatilis* (Nagy et al. 2009).

Coprinus lilatinctus Bender & Uljé, in Uljé & Bender, Persoonia 16: 373 (1997). Figs. 17–20.

Holotype: The Netherlands: Alphen a/d Rijn, prope Zegerplas, 27. August 1988, C.B. Uljé 987 (L).

Original diagnosis: *Pileus junior usque ad 30 mm altus, 16 mm latus, cylindricus, ellipsoideus vel conicus, adultus ad 50 mm latus, junior distincte lilacino-tinctus, demum lilaceo-griseo-brunneus vel pallide griseo-brunneus vel griseus, glaber. Lamellae, L = 36–45, l = 1–3(–5), liberae, primo albae demum griseae vel atrae acie pallidior. Stipes usque ad 100 × 2–3 mm, versus basim incrassatus vel bulbosus, albus vel griseo-albus.*

Sporae 9.6–13.3 × 9.0–11.2 × 6.1–8.3 µm, 5-angulatae, cordiformes, poro germinativo excentrico praeditae. Basidia 20–45 × 9–12 µm, tetrasporigera. Cheilocystidia 25–70 × 12–28 µm, vesiculosa, ellipsoidea, obovoidea vel subcylindracea, interdum utriformia. Pleurocystidia 30–95 × 22–38 µm, vesiculosa, subcylindracea, ellipsoidea vel subutriformia. Fibulae presentes. Pileipellis hymeniformis e elementis clavatis vel vesiculosis. Elementae microscopicae, praesertim in pilei-pelle vel hymenio cum granulae griseo-alutaceae. Ad terram argillaceam vel ad fragmentam lignam, gregarius.

Observations on the type—The holotype consists of several fruiting bodies, including young and mature ones, perfectly preserved. No trace of a lilaceous tint was seen on the fruiting bodies, and they were slightly more golden-yellow than usual in *P. lactea*.

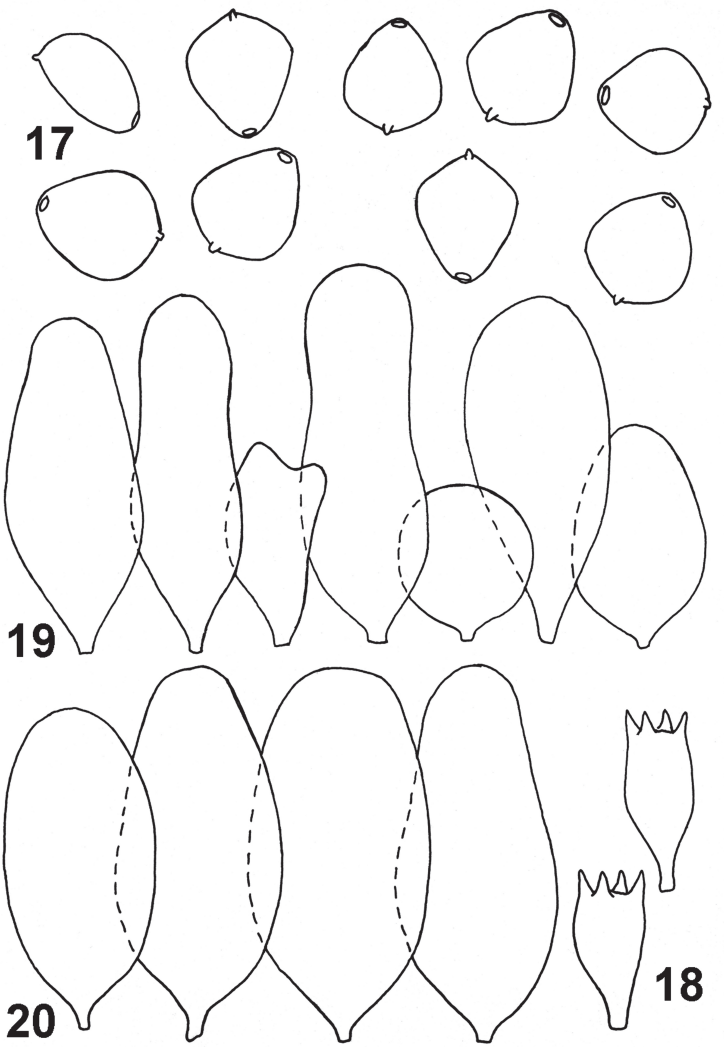

Fig. 17–20. Spores (17), basidia (18), cheilo- (19), and pleurocystidia (20) from the holotype of *C. lilatinctus*.

Basidiospores [20,1,1] 11–13.5 × 9–10.8 × 6.7–7.5 µm, on average 12.01 × 9.86 × 7.35 µm, Q_1 = 1.14–1.33, Q_2 = 1.6–1.75 strongly lentiform, in the frontal view mainly quadrangular to rounded triangular, sometimes 5- or 6-angled, or ovoid, ellipsoid to amygdaliform in lateral view, with a strongly eccentric, 1.6–1.9 µm wide germ-pore, smooth, with a moderately thick wall; basidia

four-spored, clavate, bimorphic, surrounded by pseudoparaphyses, 22–34 × 10–12 µm; CHEILOCYSTIDIA abundant, versiform, mainly cylindrical, ellipsoid or oblong, more rarely utriform or globose, 27–49 × 15–20 µm; PLEUROCYSTIDIA subcylindrical, ellipsoid, oblong or obovoid, rather abundant, 50–67 × 27–32 µm; PILEIPELLIS hymeniform, glabrous; no droplets could be observed in the basidia, pseudoparaphyses or pileipellis elements; VEIL, PILEOCYSTIDIA, and CAULOCYSTIDIA not found.

REMARKS—Although we could not find the yellowish droplets typical of *P. lilatincta* in the type, their original presence cannot be excluded. Both Uljé (in Uljé & Bender 1997, Uljé 2005) and we have repeatedly observed that these droplets disappear from the cells in older herbarium materials. Upon examination of other materials collected by Uljé at the same locality (e.g. *Uljé 1212,* preserved in L), we found traces of oily droplets, mainly in the pileipellis.

Similarly, although the lilaceous colouration could not be observed in the type material, many other specimens collected by Uljé exhibited lilaceous tints.

Coprinus megaspermus P.D. Orton, Notes from the Royal Botanic Garden, Edinburgh 32: 141 (1972). FIG. 21.

HOLOTYPE: United Kingdom, England: Norfolk. Hedenham Wood, ad terram, 24. October 1971, Orton 4132 (E).

ORIGINAL DIAGNOSIS: *A sociis a sporis vix lentiformibus permagnis facile distinguitur.*

Pileus ovoideus, 11/12 mm, dein expansus ad discum depressus, 15–30 mm, juventute fere ferrugineus dein ad discum fulvus vel cinnamomeus et ad marginem versus argillaceo-luteolus et forte plicato-striatus, vix deliquescens circa discum senectute cinnamomeotinctus. Lamellae ± liberae, nigricantes, confertae, L= ca. 50, l= 0–1, ad aciem albidoflocculosae. Stipes 52–60/2 mm; aequalis vel ad basim leviter incrassatus, albus dein pallide argillaceo-luteolus, laevis, ad basim tomentosus. Caro ad discum pilei admodum crassa. Sporae ellipsoideae vel ellipsoideo-ovoideae interdum leviter lentiformes, 15–18/8.5–9.5/10–11 µm (FIG. 1.f), in cumulo nigro-umbrinae. Basidia 4-sporigera. Cystidia aciei lamellarum ± lageniformia, ca. 50–60/18–20 µm, ad apicem conicum vel cylindrico-obtusum 8–10 µm latae. Cystidia faciei lamellarum non vidi. Cellulae cuticulae pilei 12–28 µm latae. Setulae et sphaerocystes desunt.

OBSERVATIONS ON THE TYPE—The holotype contains two, slightly fragmented mature fruiting bodies in good condition. All microscopic details have collapsed, except the basidiospores.

BASIDIOSPORES [26,1,1] 15–18.7 × 10–12 × 7.7–9 µm, on average 16.5 × 10.66 × 8.5 µm, Q_1 = 1.40–1.78, Q_2 = 1.83–1.95 strongly lentiform, in the frontal view ellipsoid, broadly ellipsoid, rarely ovoid, in the lateral view ellipsoid or subamygdaliform, germ-pore slightly eccentric, 2–2.3 µm wide, color very dark reddish brown, subopaque, smooth, with moderately thick wall; BASIDIA,

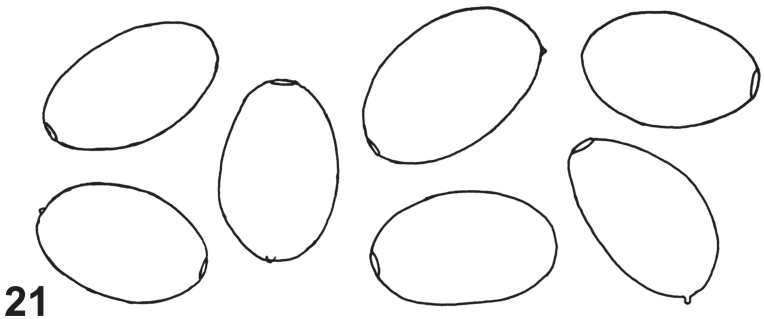

Fig. 21. Spores from the type of *C. megaspermus*.

pleurocystidia and cheilocystidia collapsed; veil, pileocystidia, and caulocystidia not found.

Remarks—The germ-pore in this collection is eccentric, albeit only slightly, which is in contrast with the finding of Orton (1972), who described the germ-pore as central. In fact, *P. megasperma* can have either a central or a more or less eccentric germ-pore, even in the same collection (Uljé & Bas 1988, Uljé 2005), so this discrepancy does not compromise the interpretation of this taxon. Phylogenetic analyses supported the view that the position of the germ-pore in this species is variable (Nagy et al. 2009).

Coprinus nudiceps P.D. Orton, Notes from the Royal Botanic Garden, Edinburgh 32: 142 (1972). Figs. 22–24.

Holotype: United Kingdom, Scotland: Inverness-shire. Tomich, ad fimum equinum, 3 September 1971, Orton 4133 (E).

Original diagnosis: *A* C. misero *sporis majoribus et habitu robustiore differt. Pileus ellipsoideus vel ovoideus 7–15/4–8 mm, dein expansus 9–24 mm interdum ad discum depressus, luteolus vel ochraceus dein ad discum fulvum vel cinnamomeum versus griseascens, primo laevis leviter nitidus, mox ad marginem dein ad discum versus sulcatus vel plicato-striatus, ad marginem postremo manifeste laceratus vel radialiter fissuratus. Lamellae liberae vel anguste adnatae, e pallide luteolo vel ochraceo mox umbrinae vel nigricantes, subconfertae, ad aciem primo albo-flocculosae. Stipes 30–60/0.5–1 mm, sursum attenuatus, leviter bulbosus (ad basim 1.5–3 mm latus) ex albido sordide cremeus vel cremeo-luteolofuscus, minute adpresse sericeostriatus, ad basim primo fibrillis albosericeis manifestis obtectus. Caro pilei concolorata ad discum admodum crassa. Odor nullus.*

Sporae lentiformes, ellipsoideo-ovoideae vel subgloboso-triangulares interdum leviter 5- vel 6-angulatae, 13–15.5/8.5–9.5/10–12 µm (Fig. 1.h), poro germinativo medio, in cumulo violaceonigrae. Basidia 4-sporigera. Cystidia aciei lamellarum pyriformia vel utriformia interdum irregulare vel late fusiformia vel vesiculosa, 30–60/14–28 µm. Cystidia faciei lamellarum non vidi. Cellulae cuticulae pilei 10–26 µm latae. Setulae et sphaerocystes desunt.

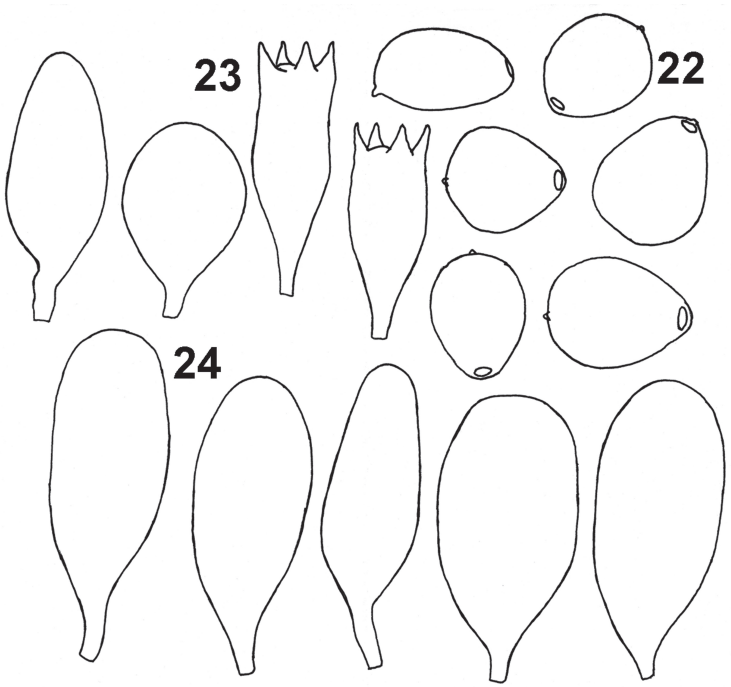

Fig. 22–24. Spores (22), basidia (23), and cheilocystidia (24) from type material of *C. nudiceps*.

Observations on the type—The holotype contains both young and mature fruiting bodies, preserved in a very good state. All essential features could be observed except cheilocystidia, which were impossible to locate because of the fragmentation of the gill edges.

Basidiospores [22,1,1] 11.8–16 × 11–13 × 8.2–8.7 µm, on average 13.94 × 11.84 × 8.45 µm, Q_1 = 1.07–1.37, Q_2 = 1.6–1.68 strongly lentiform, in the frontal view broadly ovoid to rounded triangular, some ovoid, in the lateral view ellipsoid or slightly amygdaliform, wall moderately thickened, with a strongly eccentric ca. 2 µm wide germ-pore, smooth, with a moderately thick wall; basidia four-spored, clavate, bimorphic 42–58 × 10–15 µm, surrounded by pseudoparaphyses; pleurocystidia abundant, from subglobose to ellipsoid, often utriform, 40–90 × 32–40 µm; veil, pileocystidia, cheilocystidia, and caulocystidia not found.

Remarks—Our examinations of the type confirm the general view that *C. nudiceps* is a younger synonym of *P. schroeteri* (Breitenbach & Kränzlin 1995, Uljé & Bas 1988, Uljé & Bender 1997, Uljé 2005).

In the protologue, Orton (1972: 144) states that the germ-pore is central, which cannot be confirmed here. As Orton himself depicts correctly (Fig. 1g, p. 143), the germ-pore is eccentric as is typical for this species.

Coprinus pachyterus Berk. & Broome, Journal of the Linnean Society, Botany 11: 561 (1871). Figs. 25–26.

Isotype: Sri Lanka: Peradeniya, on soil. October 1868. Thwaites 806. (K).

Original diagnosis: *Pileo persistenter campanulato plicato-sulcato; stipite firmiore; lamellis arcuatis adnexis. (Nº 806).*

Hab. Ad terram, Peradeniya Ceylon (Thwaites)–Pileus 5 cm. latus glaber; stipes 6–8 cm. longus, validior quam in C. plicatili.

Observations on the type—The holotype contains 4 entire fruiting bodies glued on paper cards. The specimens are in a rather good state.

Basidiospores [20,1,1] 11.5–13.8 × 7.3–8.2 × 6.8–7.8 µm, on average 12.61 × 7.81 × 7.2 µm, Q_1 = 1.47–1.84, Q_2 = 1.57–1.86 strongly lentiform, in the frontal view ellipsoid to oblong, in the lateral view amygdaliform, slightly flattened with a central, 1.5–1.8 µm wide germ-pore, dark blackish-brown, subopaque, smooth, with moderately thick wall; basidia, pleurocystidia, and cheilocystidia collapsed; pileipellis in a poor state, cuticular; veil elements on pileipellis diverticulate, made up of dichotomously branched, coralloid elements 5–9 µm in diameter, terminal elements often inflated, clavate; excrescences mostly with acute tips; wall of velar elements hyaline, 1–3 µm thick in places; clamp connections present.

Remarks—The material obtained on loan (coll. Thwaites 806) belongs to subsection *Alachuani* of the genus *Coprinus* s.l. by virtue of the diverticulate velar elements on the pileus and the cuticular pileipellis. In that subsection, it is apparently conspecific with *C. vermiculifer* (Joss. ex Dennis) Redhead et al. as this is the only species that combines large basidiospores with thick-walled velar elements (Josserand 1944, Uljé & Noordeloos 1996, 1997). The only difference between the types of *C. pachyterus* and *C. vermiculifer* that could be found is that *C. vermiculifer* grows on dung, based on the very limited number of collections known worldwide (Enderle et al. 1986, Uljé 2005, Uljé & Noordeloos 1996, 1997, Doveri 2004). This is of very limited value, however, considering the scarce information available on *C. vermiculifer*. Pegler (1986), who also studied the type and other collections of *C. pachyterus,* reported a hymeniform pileipellis, devoid of any veil-like structures. Further, he noted that the material consisted of two species; he referred one to *P. plicatilis* and the other to a taxon close to *P. hemerobia* (Fr.) Redhead et al. At present, *P. plicatilis* and *P. hemerobia* s. auct., which have a hymeniform pileipellis, are considered synonymous (Nagy et al. 2009, Uljé & Bas 1988, Uljé 2005, present work). However, the fungus that we examined clearly has an *Alachuani*-type veil and a

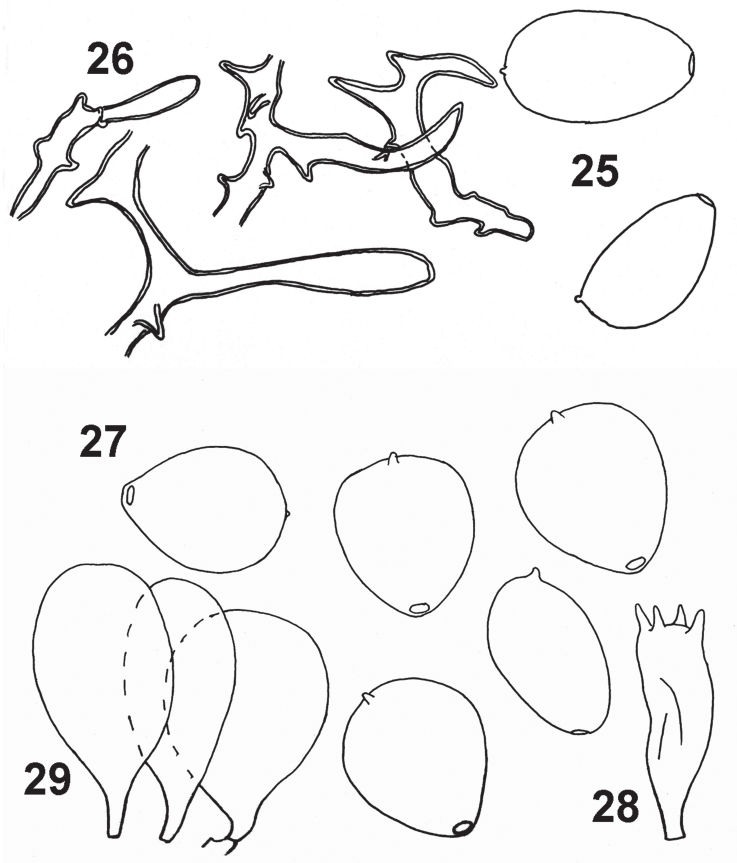

Fig. 25–29. *Coprinus pachyterus* and *C. plicatilis* var. *filopes*.
Figs. 25 and 26 represent spores and velar elements of *C. pachyterus*.
For *C. plicatilis* var. *filopes* spores (27), a basidium (28), and pileipellis cells (29) are depicted.

cuticular pileipellis, which was confirmed by re-examination of the microscopic slide made from the type. Moreover, the shape of the spores (which tend to be oblong) and central germ-pore indicate that this specimen is more similar to *C. vermiculifer*. As it is questionable whether we obtained the same specimen on loan that Pegler (1986) examined, no further conclusions can be drawn.

Coprinus pallidus Berk. & Broome, Journal of the Linnean Society, Botany 11: 560 (1871). Figs. 1–3.

Isotype: Sri Lanka: on dead wood, September 1868. G.H.K. Thwaites 1157 (Berk. 1405) (K).

Original diagnosis: *Pileo inaequali subcylindrico pallido, disco laevi umbrino; stipite flexuoso fistuloso pallido; lamellis subliberis fuscis (No. 1157, cum icone). On dead wood. July 1869.*

Pileus 3 line across, 5 high, pale umber, disc even, much dark, its edges reflected; stem flexuous, 1.5 inches high, 1 line thick, fistulose, equal, smooth, pale umber, truncate at the base; gills 1 line wide, umber, then dark brown, slightly ventricose, nearly free; spores – 0003 [0.0003 inches] long.

Observations on the type—The type material obtained from Kew contains one fruiting body in two parts, glued on a paper card and in a rather poor state. One part of the fruiting body is immature; the other parts are mature. Because of the poor state of the material, only spores, basidia, and sclerocystidia were observable. The hymenium seemed to be in good state, but cystidia were not found.

Basidiospores [20,1,1] 9–11 × 7.5–8.6 × 5.7–6 μm, on average 9.7 × 8.03 × 5.7 μm, Q_1 = 1.08–1.32, Q_2 = 1.55–1.65, lentiform, ovoid to subglobose with a rounded apex and base, not rounded triangular, but some tend to be minimally angular in the frontal view, ellipsoid, slightly amygdaloid in the lateral view, thick-walled, medium red-brown under the microscope, germ-pore central, rather small, 1.4–1.6 μm; basidia four-spored, clavate, bimorphic, ca. 22.5 × 11 μm; cystidia not found; pileipellis structure not observable, long, thick-walled, lageniform, brownish sclerocystidia present, these measure 87–150 × 6–8 μm.

Remarks—The lentiform, ovoid spores combined with sclerocystidia on the pileus readily identify this species as *P. setulosa* (Berk. & Broome) Redhead et al., as already noted by Pegler (1986). The only discrepancy that we found between the types of *P. setulosa* and *C. pallidus* is that *P. setulosa* has extremely large, pike-like sclerocystidia, whereas those of *C. pallidus* are more like those of *P. auricoma*. However, *P. setulosa* is still insufficiently known to allow the assumption that this difference falls within the range of the variability for that species.

Coprinus plicatilis* var. *filopes Wichanský, Mykologický Sborník 45: 16 (1968).

Figs. 27–29.

Holotype: Czech Republic: Prague, Kinského sady, Loco graminoso, 29. Sept., 1967, Wichansky (PRM).

Original diagnosis: *A typo differt pileo tenerrimo maturitate plane explanato 7 mm diametro, lamellis angustis, distantibus, non diffluentibus, stipite hyalino, filiformi, usque 5 cm alto et 0.5 mm crasso.*

Auctor 2 specimina loco graminoso ad viam 29. IX. 1967 in horto publico Kinského sady dicto Pragae legit. Typus in herbario Musei nationalis Pragae depositus est.

Observations on the type—The holotype envelope contains a small amount of material with fully mature pilei. Two other collections were also obtained on

loan (PRM 682556 and 682555), which were collected one year later at the same locality by Wichanský. They display similar features to those of the holotype but are also mature.

Basidiospores [20,1,1] 9.6–12 × 8.6–10.3 × 6.3–7 µm, on average 10.93 × 9.3 × 6.77 µm, Q_1 = 1.09–1.30, Q_2 = 1.5–1.65, strongly lentiform, in the frontal view mostly ovoid or rounded triangular, rarely rectangular, apex often subpapillate, in the lateral view ellipsoid, to subamygdaloid, with a 1.4–1.7 µm wide, eccentric germ-pore, dark reddish-brown, smooth, with moderately thick wall; basidia mainly collapsed, four-spored, clavate, ca. 27 × 10 µm; pleurocystidia and cheilocystidia collapsed; veil, pileocystidia, and caulocystidia not found; pileipellis hymeniform, composed of vesiculose-clavate elements, no pigment or oily granules observed, elements 25–37 × 20–27 µm.

Remarks—The spores of the holotype clearly show that this taxon is synonymous with *P. lactea.* Indeed, the fruitbodies are smaller than normal in *P. lactea,* but this feature is of no taxonomic value at all in view of the considerable variability that can be encountered even within one collection.

Coprinus schroeteri P. Karst., Meddelanden af Societas pro Fauna et Flora Fennica 5: 34. (1879). Fig. 30.

Holotype: Finland: Tavastia, Mustiala, in fimo bovino, 20. August 1878. Karst. 3762. (H).

Original diagnosis: *Pileus tenerrimus, ex ellipsoideo vel ovoideo expansus revolutusque, sulcatus, glaber, ochreo-isabellinus vel subgilvus, expallens, demum dilute fuliginatus, ad 1 cm. usque latus. Stipes aequalis, sursum leviter striatulus, primitus puberulus, 1–2 cm. longus. Lamellae fuscae. Sporae angulato-ovoideae, subinde anguloso-sphaeroideae vel sphaeroideo-ellipsoideae, fuscae (s. l.), pellucidae, longit. 13–15 mmm., crassit. 8–12 mmm. In fimo bovino prope Mustiala die 20 m. Aug. h. a. semel. Priori proximus. Solitarius.*

Observations on the type—The type material obtained on loan was in poor condition. The only character that we succeeded in observing in detail was the basidiospores.

Basidiospores [20,1,1] 13–15.3 × 11–12.8 × 9.2–11 µm, on average 14.44 × 11.83 × 9.72 µm, Q_1 = 1.16–1.27, Q_2 = 1.46–1.68 strongly lentiform, in the frontal view typically rectangular or rounded triangular with or without median constriction, more rarely ovoid, in the lateral view ellipsoid, mostly immature, with large, 2–2.3 µm wide, eccentric germ-pore, subopaque, very dark reddish brown, smooth, with a moderately thick wall; basidia mainly collapsed, four-spored, clavate; pleurocystidia and cheilocystidia collapsed; veil, pileocystidia, and caulocystidia not found.

Remarks—This collection is typical of the taxon it represents. The large, 13–15 µm long, rounded triangular spores are characteristic of this species, as is its habit on dung. The species was long considered obligately coprophilous (Bender

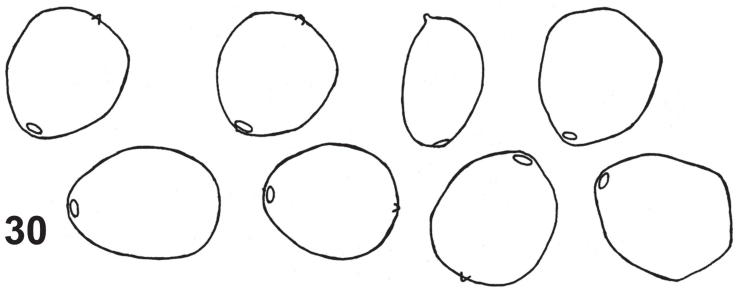

Fig. 30. Spores from the type of *C. schroeteri.*

& Enderle 1988, Orton 1972, Orton & Watling 1979). We examined over 60 collections (Nagy, unpublished) and found that it grows more often on soil than on dung. Generally, the taxa of the genus *Parasola* are more or less ubiquitous in terms of the habitat, except for *P. misera,* the only obligately coprophilous species in this group (Uljé 2005).

Coprinus setulosus Berk. & Broome, Journal of the Linnean Society, Botany 11: 561 (1871). Figs. 31–33.

Lectotype: Sri Lanka: Peradeniya, habitat and date not given, Thwaites 936. (K) (Pelger 1968: 511) Syntype: same locality, Thwaites 845. (K)

Original diagnosis: *Pileo cylindrico campanulato obtuso usque ad discum striato setis fulvis undique obsito; stipite fistulosus candido sursum attenuato; lamellis angustissimus adnexis. (Nº 845, cum icone, Nº 936).*

Hab. in vegetabilibus emortius, Peradeniya Ceylon (Thwaites)–Pileus 10 mm. altus, basi 4 mm. latus; stipes 2.5 cm. longus, medio 1 mm. crassus; lamellae adscendentes, non perfecte evoluta in speciminibus, in quibus candidae sunt sporisque carentes.

Observations on the type—The holotype contains 2 partly decayed fruiting bodies (1 old, 1 young) stuck on paper cards.

Basidiospores [21,1,1] 8.8–10.4 × 7.4–8.9 × 5.3–6.7 µm, on average 9.69 × 8.12 × 6.06 µm, Q_1 = 1.12–1.36, Q_2 = 1.40–1.88, strongly lentiform, in the frontal view subglobose-broadly ovoid, often minutely subhexagonal or triangular, in the lateral view ellipsoid to subamygdaliform, with a prominent hilum, a central germ-pore, 1.7–1.9 µm wide, color dark reddish brown, smooth, with a moderately thick wall; basidia not seen; cheilocystidia mainly collapsed, only a single complete cystidium was found, which was utriform; pleurocystidia collapsed, probably subcylindrical-oblong; pileipellis hymeniform, with long, lancet-like sclerocystidia (hairs), with brown, thick walls and an obtuse apex (as compared to *P. auricoma*), 150–310 × 10–16 µm, walls up to 3.5 µm thick; veil and caulocystidia not found.

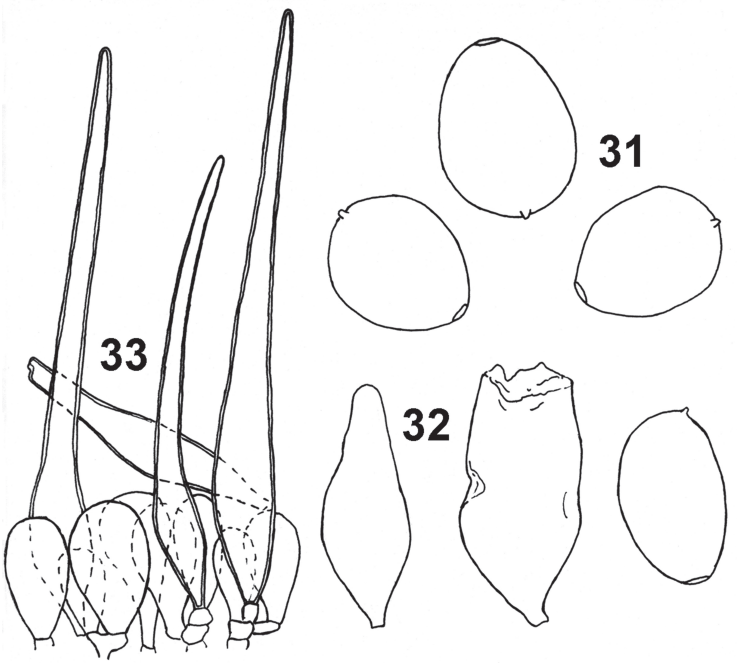

Fig. 31–33. Type material of *C. setulosus*.
Spores (31), partial cystidia (32), and sclerocystidia (33) could be observed.

Remarks—This is a good species in its own right, but, unfortunately, we know of no recent records. The only specimen reported as *C. setulosus* (WU 14796, leg.: A. Hausknecht, in herb.) is from La Réunion, but this represents a hitherto unclarified *Parasola* taxon with completely elliptical, 7–10 µm long basidiospores that may well represent an undescribed species.

Pseudocoprinus besseyi A.H. Sm., in Smith & Hesler, Journal of the Elisha Mitchell Scientific Society 62: 189 (1946). Figs. 34–36.

Holotype: USA: Michigan, East Lansing, 27. September 1945, E.A. Bessey (MICH).

Original diagnosis: *Pileus 1–2.5 cm. altus, 15–20 mm. crassus, conicus, subviscidus, glaber, demum convexus et udus, levis demum plicato-striatus, castaneus demum incarnato-cinnamomeus; lamellae confertae demum subdistantes, adnatae, angustae; stipes (3)5–8(9) cm. longus, 3–4.5 mm. crassus, aequalis, subalbidus, glaber; sporae 12–15(16) × 7–7.5 × 8–8.5 µ; pleurocystidia 100–160 × 20–30 µ, subventricosa, obtusa; cheilocystidia vesiculosa vel ventricosa, 16–25 × 10–18 µ vel 28–42 × 12–16 µ.*

Habit, habitat and distribution: Scattered to gregarious around and on plant debris, in compost heaps, buried wood, sticks and on lawns but then usually from buried debris.

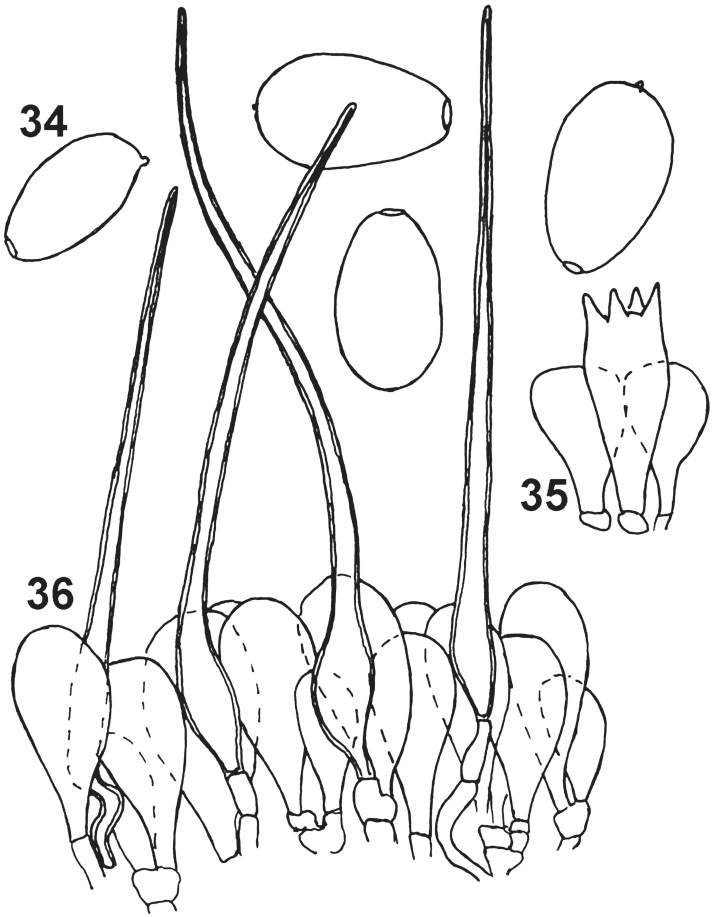

Fig. 34–36. Spores (34), basidia (35), and sclerocystidia (36) from the type material of *Pseudocoprinus besseyi*.

Observations on the type—Only part of the holotype was obtained on loan. This contained fragments of probably artificially matured fruiting bodies, in which most cells were collapsed.

Basidiospores [20,1,1] 13–15 × 8–8.9 × 7.5 µm, on average 13.79 × 8.44 µm, Q_1 = 1.51–1.74, Q_2 ≈ 1.8 strongly lentiform, in the frontal view oblong to subcylindrical, not flattened, with a 1.5–1.8 µm wide central germ-pore, color red-brown, smooth, with a moderately thick wall; basidia four-spored, clavate, bimorphic, mainly collapsed; pleurocystidia and cheilocystidia collapsed;

PILEIPELLIS hymeniform, with numerous brown thick-walled erect hairs, up to 250 µm in length; VEIL and CAULOCYSTIDIA not found.

REMARKS—These specimens clearly belong to *P. auricoma*, a well-known, widespread representative of the genus, on account of the ellipsoid spores with a central germ-pore and thick-walled hairs on the pileus. As the epithet *auricomus* dates back to 1886, it has priority over *Ps. besseyi*. Although the basidiospores are on average somewhat larger than usual in *P. auricoma,* we have confirmed that this specimen represents a younger synonym for *P. auricoma*.

Pseudocoprinus lacteus A.H. Sm., in Smith & Hesler, Journal of the Elisha Mitchell Scientific Society 62: 191. (1946). FIGS. 37–39.

HOLOTYPE: USA: Michigan, Ann Arbor, Sept. 12., 1945, A.H. Smith 20520-type. (MICH).

ORIGINAL DIAGNOSIS: *Pileus 10–15 mm. altus, 8–10 mm. latus, conicus, glaber, plicatostriatus, ad discum levis, lacteus vel „pinkish buff" (pallide argillaceus), demum lividus; lamellae adnatae, confertae, angustae, lacteae demum fuscae; stipes 3–5 cm. longus 1mm. crassus, aequalis, glaber, fragilissimus; sporae 8.4–10.5 × 5–6.3 × 7–8.4 µ; cheilocystidia distinctissima, 22–36 × (8)10–16 µ.*

Habit, habitat and distribution: Gregarious to scattered on bare soil in an oak woods.

OBSERVATIONS ON THE TYPE—Only a part of the holotype was obtained on loan. This contained portions of well-preserved, mainly mature fruiting bodies with a striking whitish pileus. Of the taxonomically important characters, we succeeded in observing basidiospores, basidia, and pleurocystidia.

BASIDIOSPORES [20,1,1] 9.2–11 × 8.2–9.2 × 5.8–6.3 µm, on average 9.99 × 8.61 × 6.12 µm, Q_1 = 1.09–1.23, Q_2 = 1.47–1.66, strongly lentiform, in the frontal view mostly rounded triangular, some ovoid or subglobose present as well, in the lateral view ellipsoid, germ-pore eccentric, 1.5–1.7 µm in diameter, color dark reddish brown, more or less translucent, but this may be because many immature spores were found, smooth, with a moderately thick wall; BASIDIA four-spored (only incomplete, collapsed basidia were found), clavate; PLEUROCYSTIDIA broadly cylindrical or ellipsoid, ca. 67 × 30 µm; CHEILOCYSTIDIA collapsed; VEIL, PILEOCYSTIDIA, and CAULOCYSTIDIA not found.

REMARKS—To judge from the above description, this species represents a synonym of the taxon currently known as *P. leiocephala*. As the name *Ps. lacteus* (1946) is older than *C. leiocephalus* (1969) and is validly published, it has priority over the epithet *leiocephalus*. The affinity of *Ps. lacteus* to *P. leiocephala* has already been suggested by Uljé et Bas (1988).

The whitish pileus is somewhat unusual for this species, as in most cases the pileus color is some shade of ochraceous or pale-brownish. Such whitish, faded collections can exceptionally be encountered in dry weather (e.g. SZMC-

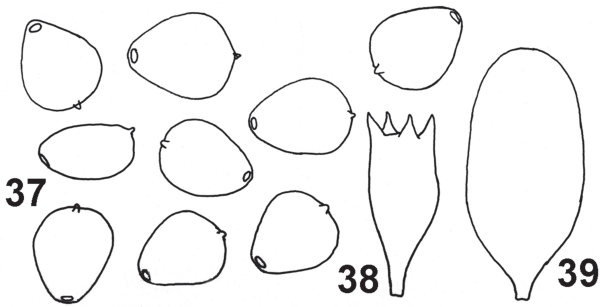

Fig. 37–39. Type material of *Pseudocoprinus lacteus*.
Spores (37), basidium (38), and pleurocystidium (39).

NL-0669 in our herbarium), but no taxonomic value can be assigned to them. In our opinion, both the holotype of *Ps. lacteus* and our collection represent extremities of the species currently known under the name *P. leiocephala* and therefore deserve no taxonomic status.

Nomenclatural revisions

Agaricus plicatilis Curtis, Flora Londinesis 1: tab. 215 [engraved no. 200]. (1781)

Original diagnosis: Stalks single, in those which are full grown two inches of more in height, the size of a small wheat straw, upright, round, of the same thickness throughout, hollow, smooth, white, and tender.

Cap at first springs up is about size of a kernel of a hazel nut, of a yellowish brown color, scarce perceptibly striated, it soon becomes an oblong bell-shaped, the small furrows appear more evidently, are somewhat waved, and the color changes to grey or mouse color, now full grown it becomes more bell-shaped, and afterwards appears flat, is from an inch to an inch and half in diameter, of a mouse color, tender, pleated, the crown, flat, brown or white; the skin transparent, without any flash, at top not sprinkled with meal, of the ridges of the plaits somewhat willous, with the fructification is over, the edge becomes black and turns in.

Gills few, of the same color as the cap, throwing out a very fine powder of a bluish-black color.

Its usual place of growth is in pastures, meadows and grass plats, in all of which it is not infrequent during the months of September and October.

Remarks—Although the protologue is quite obscure and may apply to any *Parasola* taxon, there is consensus about the interpretation and usage of the name *C. plicatilis* in recent literature (Uljé & Bas 1988, Uljé & Bender 1997, Uljé 2005). As Art 8.1 of the Botanical Code allows illustrations to serve as types, we hereby designate as lectotype:

Lectotype here designated: W. Curtis (1781), Flora Londinensis 1: tab. 215 [engraved no. 200].

Additionally, it seems necessary to designate an epitype in order to stabilize the taxonomy of this name and to give a thorough, modern description of the specimen:

> **Epitype here designated:** Hungary, Bács-Kiskun: Kecskemét, Nyír, *Convallario-Quercetum roboris* on sandy soil, 3 September 2006., L. Nagy, *SZMC-NL0075* (BP). Figs. 40–43.

Description—Pileus 5–10 × 8–20 mm when still closed, cylindrical, ellipsoid or obovoid, expanding to convex–hemispherical, finally applanate with a slightly enrolled margin and a markedly depressed disc, surface glabrous, radially translucently striate when young, on expanding becomes radially sulcate–grooved, up to 35 mm in diameter when fully expanded; margin even when young, soon becoming crenulate, color varying from melleous to pale-brown when young, becoming warm fawn on the ridges when mature, between ridges whitish, at centre with +/– sharply delimited darker button, on aging gradually becoming grayish-tinted, not discoloring; lamellae crowded, thin, free, not reaching stipe, ending up in a collarium-like formation, up to 2 mm broad, not or only very slightly ventricose, edge fimbriate in young stages, white when young, later greyish, finally blackish, different parts of the gills do not mature in parallel, not deliquescent, only collapsing when fully mature; stipe 0.5–3 × 30–70 mm, slender, fragile, fistulose, cylindrical, at base with scanty whitish tomentum, surface glabrous or finely longitudinally silky, whitish all over when young, on aging becoming pale-ochraceous; context thin and brittle, whitish, without a distinct smell or taste.

Basidiospores [20,1,1] 10.8–14.2 × 7.8–8.5 × 6.8–7.5 µm, on average 12.41 × 8.21 × 7.14 µm, Q_1 = 1.34–1.67, Q_2 = 1.61–1.86, strongly lentiform, in the frontal view chiefly limoniform–subhexagonal, more rarely ovoid, broadly ellipsoid, in the lateral view ellipsoid to subamygdaliform, with an eccentric, 1.9–2.3 µm wide germ-pore, color very dark reddish brown, opaque, smooth, with a moderately thick wall; basidia clavate, most with median constriction, bimorphic, 23–34 × 10–12 µm; cheilocystidia densely packed, mainly utriform, cylindrical, oblong, rarely clavate–globose, 40–60 × 13–27 µm; pleurocystidia mainly broadly utriform, oblong or subcylindrical, often obovoid, rather abundant; pileipellis hymeniform, glabrous; veil, pileocystidia, and caulocystidia absent; clamps present.

Nuclear ribosomal ITS and LSU sequences have shown that the epitype collection is nested within the clade formed by other specimens of *P. plicatilis*. These sequences clustered together with other materials of *P. plicatilis,* forming a well-supported lineage (BPP: 1.00, ML and MP bootstrap: 100%) (Nagy et al. 2009). In this case it was important to test the position of the epitype specimens, because unpublished sequence data suggest the existence of another species related to *P. plicatilis*. Typical specimens of this hitherto undescribed taxon

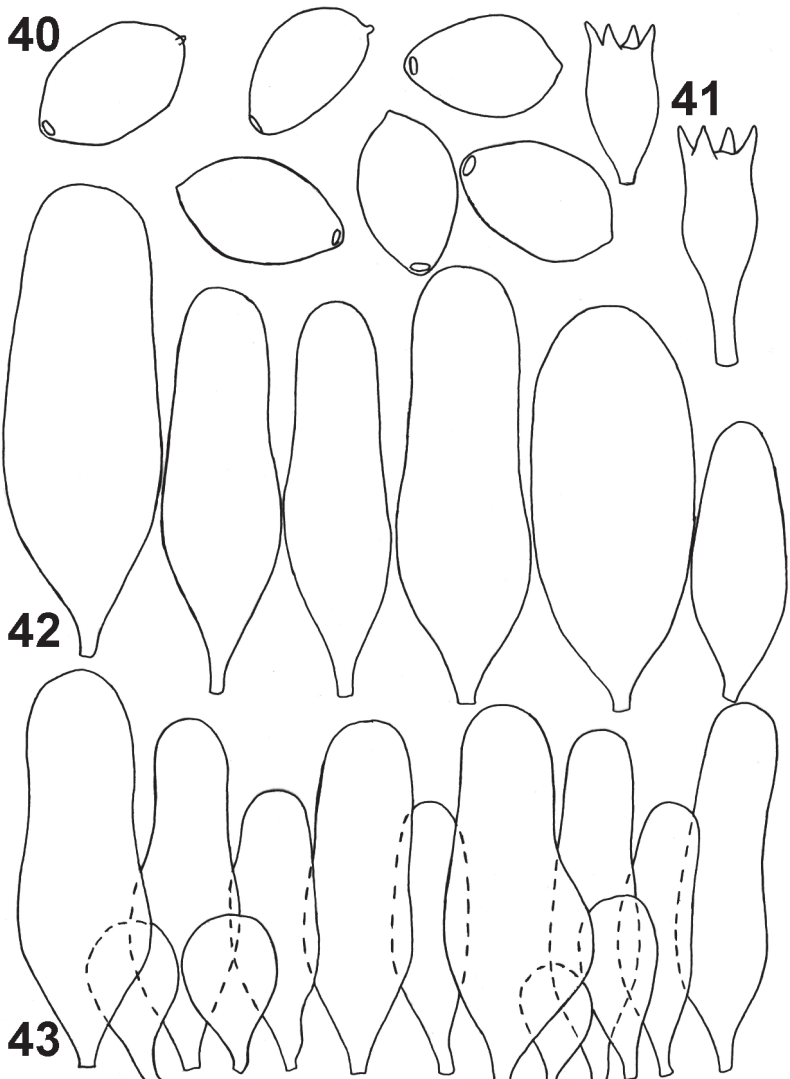

Fig. 40–43. Epitype of *Parasola plicatilis*.
Spores (40), basidia (41), pleuro- (42), and cheilocystidia (43) are depicted.

have a lilaceous stipe, and a slightly darker-brown pileus than *P. plicatilis*. As in *P. lilatincta*, it is often difficult to recognize the lilaceous colouration of the stipes.

Further, in dried specimens, the lilac colouration fades to a dark ochraceous tint, making identification of dry materials difficult.

Agaricus subtilis Fr., Systema Mycologicum 1: 302. (1821).

Original diagnosis: *pileo submembranaceo campanulato levi albido, lamellis adnatis nigris, margine albis, stipite glabro albo. Tenellus. Stipes ½ unc. Longus, filiformis, nudus, laevis, fragilis. Pileus 3 lin. altus & latus, obtusus, leavis. Lamellae latiusculae, adscendentes, cinereo-nigricantes. In fimo locis udis silvaticis. Sept. Oct.*

Remarks—Some authors consider this taxon a synonym of *P. misera* (e.g. Josserand 1962) or *P. schroeteri* (Bender & Enderle 1988). Although the original diagnosis allows such an interpretation, many important details are missing from the description, and we prefer therefore not to assign this name to *P. schroeteri*. Orton & Watling (1979: 10) came to the same conclusion.

Coprinus auricomus Pat., Tabulae Analyticae Fungorum 1(5): 200. (1886).

Original diagnosis: Chapeau ovoide puis campanulé, membraneux, glabre sur la disque, pruineux (á la loupe) sur le restant, cendré-roux avec le sommet brun-rougeátre, finement strié. Lames étroites, serrées, roussátres-noires; cystides cylindriques; spores ocracées-brunes. Stipe vreux, gréle, blanc, fragile, glabre.

La jeune est d'abord enveloppé par un ozonium doré, dont il reste parfois des filaments sur le chapeau adulte et á la base du pied. L'aspect cendré pruineux du chapeau est du aux cellules epidermiques incolores placées sur un tissu roussátre.

Cespiteux sur les vieilles souches. Été. Bois de Vincennes.

Remarks—We did not succeed in locating any specimen as type. However, Table 453 of Patouillard (1886: 200) can serve as type, and accordingly we hereby designate this as lectotype:

Lectotype here designated: N.T. Patouillard (1886) Tabulae Analyticae Fungorum 1(5): tab. 453. 1886.

The original description is sufficiently diagnostic for a clear-cut definition of this taxon.

The structure interpreted as ozonium by Patouillard may in fact represent abundant thick-walled hairs at the base of the stipe. This is often visible on young fruiting bodies, but vanishes during development of the stipe. We have not observed true ozonium in any species of *Parasola* to date.

Coprinus elongatipes A.H. Sm. & Hesler, Journal of the Elisha Mitchell Scientific Society 62: 180 (1946).

Original diagnosis: *Pileus 2–5 cm. latus, conicus vel convexus, udus, glaber, hygrophanus, cinnamomeo-brunneus dein fulvus vel avellaneus, cum sicco atomatus, non plicatus; lamellae ferrugineo-brunneae, perangustae, confertae, adnatae, margine albo-fimbriatae; stipes 6–10 cm. longus 2–3 mm. crassus, fragilis, aequalis, sursum pruinosus, deorsum glaber; ozonium fulvum; sporae 10–12.5 × 6.5–8 µ, ellipsoideae vel subovoideae.*

Habit, habitat and distribution: Among grass and weeds on soil in open deciduous

woods, Estes Park, Rocky Mountain National Park, 8500 ft. elev., July 10, 1940, L.R. Hesler 12689-type

Remarks—The type specimen in TENN is thought to be missing. It has been suggested (Patricia Rogers, pers. comm.) that it may have been transferred to MICH, but we did not succeed in finding it there.

Despite the lack of type we consider that this species is synonymous with *P. auricoma*, which is supported by the original description. Although not mentioned in the protologue, Smith & Hesler (1946: 181, Fig. 1E) depict the characteristic thick-walled hairs on the pileus, characteristic of *P. auricoma*.

Coprinus hansenii J.E. Lange, Dansk Botanisk Arkiv 2(3): 48 (1915).

Original diagnosis: Spores oval-ovate, 12–13 × 7 µ, dark grayish-brown, slightly pellucid. Basidia 9–10 diam.; paraphyses 17–18 µ. Cystidia vesiculous, somewhat bottle-shaped, with a short or rather long neck about 20 µ broad. The surface of the cap is formed by balloon-shaped or almost pyriform cells (16–24 µ broad).

Fig. Specim.: Hunderup, on the ground near a dead stump of Populus, June 1902.– Also Horsens, 1908, and Lundeborg, Aug. 1914, on naked ground behind a garden-hedge.

Cap at first oval-cylindric, 1¼–2 cm high, dark rufous chestnut-brown (apex darker), naked, striate, then expanded, at last flat, fisso-sulcate 2/3 way up (disc flat or slightly depressed), 3–4.5 cm across, of a lighter and paler brownish color than the bud. Stem rather tough, whitish (tinted slightly brownish), inside subochreceous, fistulose, glabrous, top somewhat striate, 7–9 cm × 3–4 mm. Gills free, narrow, at first pale, then ochraceous-brown, at last black, hardly diffluent. Subfasciculate.

Having found no description anywhere of this characteristic species I have named it after Hansenii in commemoration of the Danish biologist and mycologist Emil Chr. Hansen, author of Fungi fimicoli Danici.

Remarks—Although Lange (1915, 1935) describes the pileus as devoid of hairs, we acknowledge the widely accepted synonymy of *C. hansenii* with *P. auricoma* (Breitenbech & Kränzlin 1995, Uljé & Bas 1988, Uljé 2005). Orton & Watling (1979) disagreed upon the synonymy of *C. hansenii* with *P. auricoma,* suggesting that Lange's species may be a forgotten taxon needing rediscovery. However, as all other details of the original description as well as the figures given by Lange agree with those of *P. auricoma*, and we have been unable to find any specimen that would fit the description, for the time being we prefer to treat *C. hansenii* as a synonym of *P. auricoma*.

Coprinus hemerobius Fr., Epicrisis Systematis Mycologici: 253 (1838).

Original diagnosis: *Pileo tenerrimo ovato laeviusculo, expanso campanulato fisso sulcato glabro, vertice subprominente, stipite elongato attenuato glabro pallido, lamellis linearibus e pallido-nigricantibus collario obsoleto adnexis.* A. campan. *Bolt. 31. Pollich. Pal. 3. p. 295. Cfr. Secr. N. 428. Juxta vias. Habitus omnino praeced. Sed stipes collarium vix manifestum, lam. 1–1.5 lin. latae. Notis discerni nequit* A. bubalinus *Schum. (Fl. Dan. T. 1960. f. 2.) a statu primario, pileo nondum fisso.*

Remarks—The identity of this taxon has long been disputed (Orton & Watling 1979, Orton 1972, Uljé & Bas 1988). Most commonly, the epithet *hemerobius* has been applied to *P. auricoma* and *P. plicatilis* (Kühner & Josserand 1934, Lange 1935, Uljé & Bas 1988), but since no type material exists, we consider it a name to be rejected.

In the literature, this name is often used to refer to a species with elliptical basidiospores and glabrous pileus (i.e. no hairs on the pileipellis) (Orton 1972, Orton & Watling 1979). Orton & Watling (1979) distinguished this species from *P. plicatilis* in view of its not or only slightly lentiform spores and incompletely expanding pileus. In our experience, the spore shape can vary considerably, but we have never observed completely non-lentiform spores during our studies on *Parasola* (Nagy, unpublished). It has also been argued that, in fact, this species does not exist (Uljé & Bas 1988). In course of our examinations of hundreds of *Parasola* collections, we have come across a few specimens with such a combination of features (ellipsoid spores, and no hairs on the pileus), but careful examination of these specimens always revealed some tendency of the basidiospores to be hexagonal or ovoid and lentiform. Hence, in our opinion, the above-mentioned interpretation of *C. hemerobius* refers to +/– aberrant collections of *P. plicatilis*. Due to the dubious usage of the epithet *hemerobius,* we continue to use *P. plicatilis* for these collections.

Coprinus longipes Buller, in Bisby et al., Fungi of Manitoba: 118 (1929).

Original description: pileus 6–10 mm. high before expansion, bay-brown, darker at the obtuse apex, at first conico-campanulate, on expanding becoming broadly convex but never becoming flattened or revolute, thus resembling the pileus of *C. plicatilis*; when fully expanded 13–23 mm. broad, usually 15–18 mm.; the disc 3–4 mm. wide, reddish brown and markedly depressed; the convex sides of the pileus grayish brown and beautifully plicate, the surface of the pileus lacking both hairs and scales. Stipe sometimes only 4–5 cm. long, but usually 6–11 cm., occasionally up to 15 cm. long, evenly cylindrical, 1–1.5 mm. in diameter except at the base where it is 2 mm., straight, somewhat brownish below, white above, smooth, hollow, somewhat stiff. Gills grayish, narrow, 1–1.5 mm. wide, free and attached to a collar below the disc, autodigestion ocurring to some extent along the edges. Flesh very thin, brownish at the disc. Spores black in mass, jet-black under the microscope, smooth, rounded heart-shapes with three differring dimensions, 14–15.5 × 12–13 × 10 µ. Basidia dimorphic, each surrounded by 5–8 paraphyses. Cystidia on the sides of the gills, ovoid-tapering, sometimes capitate, fairly numerous in the young pilei but disappearing by deliquescence during spore discharge. Observed on a number of occasions in laboratory horse-dung cultures, coming up after several weeks or month.

This species resembles *C. plicatilis* in general appearance and might be mistaken for it; but it differs in coming up on horse dung instead of in grassy places, in having a slightly smaller depressed disc, in having gills which waste or deliquesce at their edges instead of remaining entire, and having a stipe which is usually longer.

Remarks—In our opinion, the above description fits very well with *P. schroeteri*. All the diagnostic features are given by Buller: plicate, glabrous pileus, flattened spores with length between 13 and 15 µm, no deliquescence, habitat on dung and resemblance to *C. plicatilis*, and we feel that it is sufficient enough to synonymize it with *P. schroeteri*. This is in contrast with the opinion of earlier authors (Bender & Enderle 1988, Uljé & Bas 1988), who preferred to consider it a nomen dubium. They came to this conclusion because, when tracing the type, only spore prints were received (not made by Buller himself), which they assigned to *C. marculentus*, a totally different species. However, we see no evidence that the spore prints and the type of *C. longipes* have anything in common. Furthermore, the original diagnosis (as far as it can be trusted) excludes *C. marculentus* by stating: "the surface of the pileus lacking both hairs and scales".

Similar to Uljé & Bas (1988), we could not locate the type.

Considerably after the publication of this name, Buller (1958: Figs. 35–39) reported photographs of *C. longipes*, depicting a typical *Parasola*-like fungus. The photographs were taken from laboratory cultures, which may explain the unusual length of stipes (for instance, when cultured in flasks). Unfortunately, the photographs are not accompanied by collection numbers or dates, so they are not suitable for typification.

Coprinus mirabilis Mont., Annales des Sciences Naturelles, Botanique, 4e Sér., 1: 106 (1854).

Original diagnosis: *Pileo tenerrimo primitus… tandem explanato sulcato albo margine crenulato, stipite gracili fistuloso concolori, lamellis distantibus convexis tandem nigris, sporis globosis.–Hab. In herbidis ambulacri urbis Cayennae. Coll. 1059.*

Remarks—The only clue that suggests a *Parasola* species in the protologue is the globose spores. Otherwise, it is very unclear and may apply to numerous *Coprinus* s.l. species. We could not trace any type material. Pegler (1983) presented specimens and a description of a mushroom with affinities to *P. auricoma,* but differing in lenticular spores. However, it was not detailed how this species relates to the original description and what the author's concept is based on. As presented by Pegler (1983), *P. mirabilis* may be similar if not identical with *P. setulosa* (see above).

Coprinus miser P. Karst., Bidrag till Kännedom af Finlands Natur och Folk 37: 236 (1882).

Original diagnosis: Glasklar, m. späd, bar ljust askgrå; hatten veckad; lamellerna glesa, få (6–15), slutl. Af sporerna svarta; sporerna pyramidförmigt äggrunda eller elliptiska. Hästexkr. 9. finl. (Mustiala).

Remarks—We could not trace any type material in H. However, as there is consensus concerning the usage of this name, we hereby designate a neotype, nested in the *P. misera* clade by ITS and LSU sequences (Nagy et al. 2009):

Neotype here designated: Hungary, Heves: Bükk mts., Cserépfalu, Bogár-hegy, on cow dung, in grazed, calcareous mountainous grassland, 12 March 2007, L. Nagy, *SZMC-NL-0280* (BP). Figs. 44–47.

Description of the neotype—Pileus 3–6 × 1–4 mm when closed, ellipsoid, obovoid, rarely subglobose, expanding to obtusely conical or campanulate, convex-hemispherical when older, applanate or plano-concave when fully mature, up to 15 mm in diameter; margin straight, translucently striate up to 2/3rd of pileus, even when young, later becoming undulate-crenate as the pileus expands, surface glabrous, smooth at disc, slightly rugulose-grooved when young, upon expanding becomes sulcate-plicate; color warm melleous, apricot colored, darker towards disc, becoming greyish on aging; lamellae crowded, free, forming a delicate collarium-like structure around stipe, up to 1.5 mm broad, strongly ventricose, edge fimbriate, whitish, color whitish when young, gradually becoming grayish to blackish, maturation takes place in patches, not deliquescent; stipe 0.3–1 × 10–25 mm, cylindrical, often with a somewhat swollen base, fistulose, very fragile, minutely silky-fibrillose when young, later glabrous-silky, whitish to pale ochraceous when old; context very thin, fragile, without peculiar smell or taste.

Basidiospores [20,1,1] 8.5–10.6 × 8.5–10 × 5.9–6.6 µm, on average 9.45 × 9.05 × 6.21 µm, Q_1 = 0.96–1.12, Q_2 = 1.43–1.61, strongly lentiform, in the frontal view subglobose, rounded triangular or heart-shaped, more rarely ovoid, apex sometimes papillate, in the lateral view ellipsoid, with a 1.5–1.7 µm wide, strongly eccentric germ-pore, color very dark reddish brown, opaque, smooth, with moderately thick wall; basidia bimorphic, clavate, often with median constriction, four-spored, 25–35 × 9–10 µm; cheilocystidia clavate, vesiculose or globose, abundant, 20–25 × 13–17 µm; pleurocystidia absent; pileipellis hynemiform, made up mainly of vesiculose-globose elements, 22–40 × 21–25 µm; veil, pileocystidia, and caulocystidia absent; clamps present.

Coprinus miser* f. *marasmioides Romagn., Bull. Soc. Mycol. Fr. 77: 325 (1962, "1961").

Original diagnosis: *A typo differt pileo truncato et sporis minoribus, 7.7–9.5 × 7–9 × 5.7–6.5 µ.*

Remarks—Unfortunately, type material could not be obtained from PC. From the size of the basidiospores it may be assumed that this collection belongs to the variant with four-spored basidia (two-spored specimens represent a

phylogenetically distinct taxon; Nagy et al. unpubl.), and we therefore consider this taxon a synonym of *P. misera* var. *misera*.

Coprinus plicatilis* var. *microsporus Kühner & Joss., Bulletin de la Société Mycologique de France 50: 57 (1934).

Original diagnosis: Dans l'herbe ou les feuilles mortes au Bois de Vincennes, mai-juillet. Chapeau (D: 1.5–4 cm) campanulé subglobuleux ou ellipsoide puis conique obtus surbaissé ou convexe plan, souvent nettement déprimé ombiliqué et á la fin cyathiforme mais parfois aussi non ombiliqué ou méme obtusément mammelonné au fond de la dépression centrale, plissé véliforme, brunátre puis gris, gris jaunátre diaphane avec le centre gris-jaunátre, jaune-brun hyalin ou fauvátre (jaune brun au début).

Revétement glabre ou micacé sur les cótes.

Lames (L:28–50; l:1) +/– espacées chez l'adulte, ténues diaphanes adnées á un disque bien développé.

Stipe (H:4–7.5 cm; D:1–2 mm) subégel, blanc hyalin (la base parfois un peu hyalin brunátre) glabre ou un peu soyeux, tubuleux.

Spores brun bistre foncé et opaque s.l. mais pas tout á fait noires, á silhoutte ovoide, ovoide cinuque, ovoide rhombique, nettement atténué vers la partie supérieure, á profil elliptique aplani sur la face dorsale: 8.2–10 × 5.5.–7.5 × 4–5.7 µ.

Pore légérement incliné sur la face ventrale.

Basides tétrasporiques.

Cystides faciales de grande taille.

Revétement piléique celluleux hyméniforme dépourvu de poils; voile nul.

Ad caules emortuos, et folia putrescentia. Gallia.

Remarks—This taxon is currently known as *P. kuehneri* (Uljé & Bas 1988). It is characterized by small spores with a tendency to be rhomboid or quadrangular. Other differences, such as a brighter color of the pileus and more cylindrical cheilocystidia (Uljé & Bas 1988, Uljé & Bender 1997), are, in our experience, not sufficiently constant to be considered diagnostic for identification.

Coprinus plicatilis* var. *tenellus Rick, Broteria 5: 20 (1906), as "*tenella*".

Original diagnosis: *Ad terram. Firmior et minor quam typus et pede minute pruinoso. Similis* Coprino filiformi Berk. et Br.

Remarks—In our opinion, this taxon certainly does not belong to *Parasola* in view of the pruinose stipe and the resemblance to *C. filiformis* (probably a *Coprinopsis*) as mentioned by Rick. Unfortunately, we did not succeed in locating the type.

Coprinus proximellus P. Karst. Meddelanden af Societas pro Fauna et Flora Fennica 5: 34 (1879).

Original diagnosis: *A praecedente praecipue sporis ellipsoideis, fuscis, semipellucidis, 10-13 mmm. longis, 5-7 mmm. crassis recedens. Locis stercoratis in horto Mustialensi mensibus Majo et Augusto parce. Pileus primitus subhirtellus et pallide subgilvus. Solitarius.*

Remarks—We could not locate the type material, and the original description is quite obsolete. To judge from the spore size it could be either *P. plicatilis* or *P. auricoma*.

Coprinus pseudonycthemerus Britzelm., Hymenomyceten aus Südbayern. IX. Teil: 13, Melanospori f. 250 (1893). [Also published as: Botanisches Centralblatt 54: 70 (1893).]

Original diagnosis: (from Bot. Centralbl. 54: 70): Sp. 14 : 10, unförmlich rundlich mit einem spitzen Ende; H. gefurcht, gelbgrau, grau, Mitte gelblich; L. z. g., angeheftet, grau, schwarz bestäubt, zuletzt schwarz; St. durchscheinend, unt etwas rothbraun, s. gebrechlich; Sommer, Herbst, A.

Remarks—Uljé & Bas (1988: 444) and Bender & Enderle (1988) pointed out that this species might have affinities to *P. schroeteri*. This is supported by the rounded spores with a size of around 14 × 10 µm. Unfortunately, Britzelmayr left types only very scantily, and accordingly tracing of the type of this species is very unlikely.

Coprinus rimosus Copel., Annales Mycologici 3: 26 (1905).

Original diagnosis: *Pileo tenui, cylindrico-campanulato vel conico, truncato, 1.5–2 cm alto et lato, glabro, pseudo-plicato, in lamellis moi deorsum fisso, externe fulvo-griseo, in rimis nigrescente, discus fulvo, plano vel depresso; lamellis liberis, modice remotis, stipitem versus excavatis, ad marginem obtusis, nigris pallescentibus, cystidiis carentibus: sporis nigris, typicis subangularibus, 15 × 13.5 µ, apicem versus crassissimis; stipite albo, glabro, aequali, cavo.*

Ad fimum aequinum. Manila.– A Coprino plicatili *Fries pileo non explanato, sporis crassioribus et substrato fimi distinguitur.*

Remarks—We consider that the glabrous pileus, the habitat on dung, and the spore size are sufficiently diagnostic for a clear identification of *C. rimosus* as a younger synonym of *P. schroeteri*. This relationship has already been suggested (Uljé & Bas 1988), but no conclusion was drawn awaiting further evidence or type study. The type could not be found at UC, MICH, or WELT.

Coprinus sulphureus McClatchie, Proceedings of the Southern California Academy of Sciences 1: 381 (1897).

Original diagnosis: *Pileo oblongo-campanulato, dein expanso et margine revoluto, griseolo v. luteolo-brunneo, subtiliter striato, villoso, 2-3.5 cm. alto; stipite cavo, sursum attenuato, 5–7.5 cm. longo, medio 3–4 mm. crasso, pilis luteolis tecto; lamellis liberis, linearibus, 8–12 mm. latis, acie sulphureis; sporis ellipticis, 15–18 × 8.*

Hab inter folia et ramos dejectos sub arboribus, Pasadena et Compton Californiae (McClatchie).

Remarks—The above description fits best with *P. auricoma*, although the spores are slightly larger, but the yellowish hairs on the pileus are diagnostic. Unfortunately, no recent description or type study is available for this taxon.

Coprinus virgulacolens Cleland, Transactions of the Royal Society of South Australia 57: 194 (1933).

Original diagnosis: *Pileus 1.2–2.5 cm., 16 mm. altus cylindrico-conicus ad lato-conicus, deinde se expandens, membranaceus, disco glabro subconvexo fusco, striato-plicatus, pallido-furfuraceus-granulosus, cinereo-brunneus. Lamellae subadnexae vel adnatae, primum adscendentes, confertae, angustae, albidae, deinde purpureo-brunneae. Stipes 3.7–6.2 cm., granulosus et striatus, deinde glaber, concavus, sub-bulbosus, albus. Caro pertenuis, brunnea. Sporae obliquae, fuscae, 7.5–9 µ, interdum 11 × 4–5 µ. Plantae in terra virgulis applicatae. S.A.–Mount Lofty.*

Remarks—Simpson & Grgurinovic (2001) recombined this taxon in *Parasola*, presumably on the basis of a former examination and lectotypification (Grgurinovic 1997). However, both the original description and the observation of Grgurinovic (1997) point away from the genus *Parasola*. The protologue clearly mentions granulosity of the pileus and stipe when young, a feature typical of subsection *Nivei* of *Coprinus s.l.* Unfortunately, no further information can be found in the above-mentioned two descriptions and no type material could be obtained from AD. Therefore, for the time being we feel it premature to draw any conclusion about the identity of this taxon.

Psathyrella subprona Cleland, Transactions of the Royal Society of South Australia 51: 306 (1927).

Original description: Pileus ½ in. (1–2 cm.) broad, 3/8 in. (10mm.) high, conico-campanulate with an acute apex, drying an opaque pallid whitish with fine anastomosing striae, greyer when moist. Gills ascending a little, adnate, moderately close, clouded fuscous-grey. Stem 1 to 1 and ½ in. (2.5 to 3.7 cm.) high, slender, slightly mealy, then polished, slightly hollow, somewhat brittle, white. Flesh thin, that of the stem different in textrue from the flesh of the pileus. Spores nearly black, elliptical, 15x8 µ.

Remarks—To judge from the only available modern description (Grgurinovic 1997: 475), this species may be closely related or even conspecific with the taxon currently known as *P. megasperma*. Grgurinovic (1997) reported the germ-pore as central, whereas *P. megasperma* usually has a more or less eccentric germ-pore. Unfortunately, type material could not be obtained from AD. Without study of the type, however, the available evidence is not sufficient to allow change of the widely accepted name *megasperma* to *subprona*.

Pseudocoprinus brunneolus McKnight, in McKnight & Allison, Morris Arboretum Bulletin 20: 73 (1970, "1969").

Original diagnosis: *Pileus lato-convexus disco subdepresso praeditus, 10–17 mm diam.; discus glaber, modice brunneus, profundo plicato striatus, e disco ad marginem roseo-griseus usque brunneo-roseus; caro tenuis, odore et sapore carentibus.*

Lamellae crassae, dissettae cum lamellulis alternantes, primum albae deinde griseae demum sporis maturis fere atrae, margine acuto et superficiebus convergentibus praeditae, non deliquescentes, in maturitate e stipite separantes.

Stipes cartilagineus, fragilis, 20–50 × 0.5–1.0 mm filiformis, semi translucidus, albus, glaber, bizonatus, cellulis texturae centralis in zona interiori 4–5 µ, in zona corticali 1.3–3.5 µ diam.

Cuticula pilei e palo cellularum piroformium 25–40 × 15–18 µ composita; hypodermium in KOH ochraceum; cheilocystidia e subcylindrico clavata vel ventricosa, tenui-tunicata, fasciculata, 11–15 × 55–60 µ; pleurocystidia non visa; basidia tetraspora; sporae in KOH sordide cacainae, a latere visea brevi-ellipticae et applanatae, a fronte angulato-ovoideae, distincte apiculatae, uniguttulatae, 9–11.8 × 6.7–7 × 7.9–9.7 µ, poro germinationis distincto lato apicali praeditae.

Hab. ad terram muscosam sub Quercus, *Laurel, Maryland. Typus legit O.K. Miller 6919 (BFDL).*

Remarks—The above description fits perfectly with *P. lactea* (= *P. leiocephala*) in all important details, and we therefore consider *Ps. brunneolus* to be a synonym of that species. Unfortunately, we did not succeed in finding the type in BFDL (= CFMR).

Discussion

As might be expected from in-depth nomenclatural revisions of even better known taxa, we found that numerous names neglected in the recent literature have priority over their younger counterparts in every day usage. We were able to study types of 15 taxa formerly recombined or affiliated with *Parasola* or *Coprinus* subsection *Glabri* and *Auricomi*. As a result of the study of the holotype of *Ps. lacteus,* we found that *P. leiocephala* should be substituted by *P. lactea,* which dates back to 1946, as opposed to *Coprinus leiocephalus*, which was described in 1969. This relationship has already been suggested by Uljé & Bas (1988), but they did not study the type, and hence could not come to the proper conclusion.

Coprinus leiocephalus is such a widely accepted and used name that the necessity of a name change raises the possibility of conservation of the epithet *leiocephalus* against *lacteus*. The conservation of a name simply because it is inappropriate or not popular is generally counteradvised, and we think that in this case it is better to adhere to the rules than to initiate a long-lasting decision procedure by the Nomenclatural Committee. Besides *P. leiocephala*, *Ps. brunneolus, C. plicatilis* var. *filopes,* and *C. galericuliformis* should be synonymized with *P. lactea*. Of these, *C. galericuliformis* is often accepted as a separate taxon (e.g. Orton & Watling 1979, Roux 2006, Uljé & Bas 1988, Uljé 2005), but no straightforward definition is given by any of the mentioned authors. The only difference constantly cited is the shape of the spores, which is subglobose, whereas *P. lactea* should differ in having more triangular spores (Roux 2006, Uljé & Bas 1988, Uljé & Bender 1997, Uljé 2005). In fact the type of *P. galericuliformis* is composed of immature fruiting bodies, and hence the

shape of the spores is not surprising. Specimens of *P. lactea* with partially subglobose spores can be encountered quite often (Nagy, unpublished, Uljé & Bas 1988). Molecular studies using ITS and LSU sequences have demonstrated that specimens with subglobose spores are identical to *P. lactea* and that phylogentically only one species can be recognized in this group (Nagy et al. 2009).

We found the following taxa conspecific with *P. auricoma*: *Ps. besseyi*, *C. sulphureus*, *C. hansenii*, *C. elongatipes*. A name change from *P. megasperma* to *P. subprona* will likely be needed in the future, but as we were unable to obtain the type material of *Psathyrella subprona* on loan, at this stage we refrain from formally proposing a name change.

Parasola setulosa is redescribed on the basis of the holotype as a species with brown, thick-walled sclerocystidia on the pileus (similarly to *P. auricoma*) and lentiform spores, a unique combination of characters in the genus *Parasola*. Unfortunately, this species is known only from three type collections. New collections would be helpful in addressing the variability and phylogenetic position of this species. As *P. setulosa* combines morphological features of early-branching *Parasola* taxa (*P. conopila* and *P. auricoma*) with features of other taxa of the genus (which we formerly referred to as "crown" *Parasola* taxa, e.g. *P. plicatilis* and *P. lactea*, see Nagy et al. 2009), we hypothesized it may represent a link between *P. auricoma* and the other collapsing species of *Parasola* ("crown" *Parasola* taxa).

As exemplified above, many names of coprinoid fungi (*Parasola, Coprinellus* and *Coprinopsis*) that are out of use today may apply to well-known and common taxa. Although this is a general phenomenon in all groups of organisms, it may be particularly pronounced in coprinoid fungi, because this group has been central in research in consequence of the practical importance of certain taxa as model organisms. Type revisions of other groups of coprinoid fungi show that many of the currently well-established names have older, validly published synonyms (Nagy, unpublished). Similarly, nomenclatural and taxonomic questions of the genus *Parasola* are far from being settled, and much research is needed to clarify species boundaries and distributions.

Acknowledgements

The curators of the herbaria BP, E, H, K, MICH, and PRM are thanked for the loan of type specimens. The Synthesys program enabled the first author to visit the Nationaal Herbarium Nederland (L) and to study many types of C.B. Uljé, for which we are very grateful. The authors would like to thank to an anonymous reviewer for valuable comments. Francesco Doveri and Jan Vesterholt are thanked for valuable suggestions and corrections on the manuscript.

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